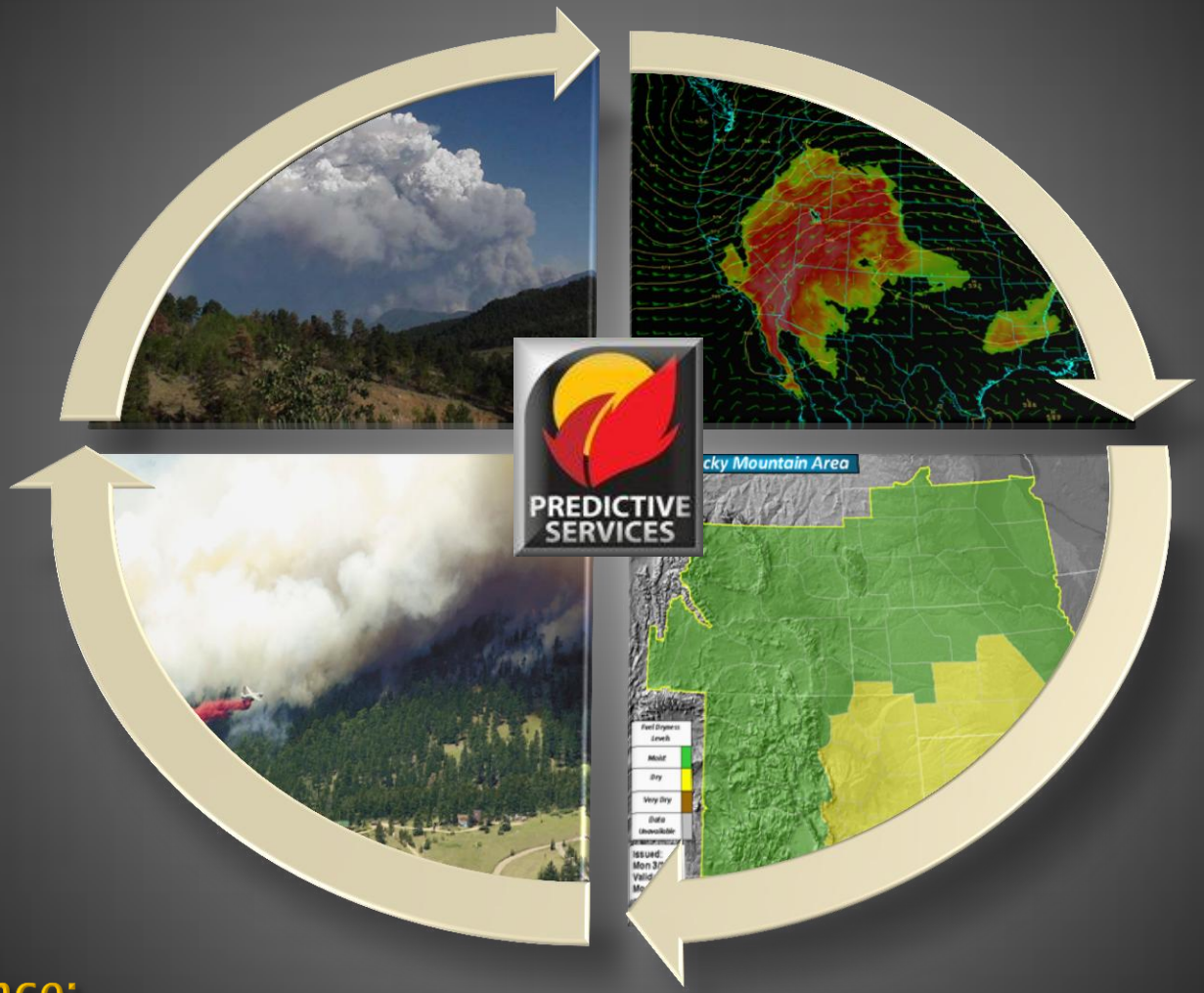
Predictive Services

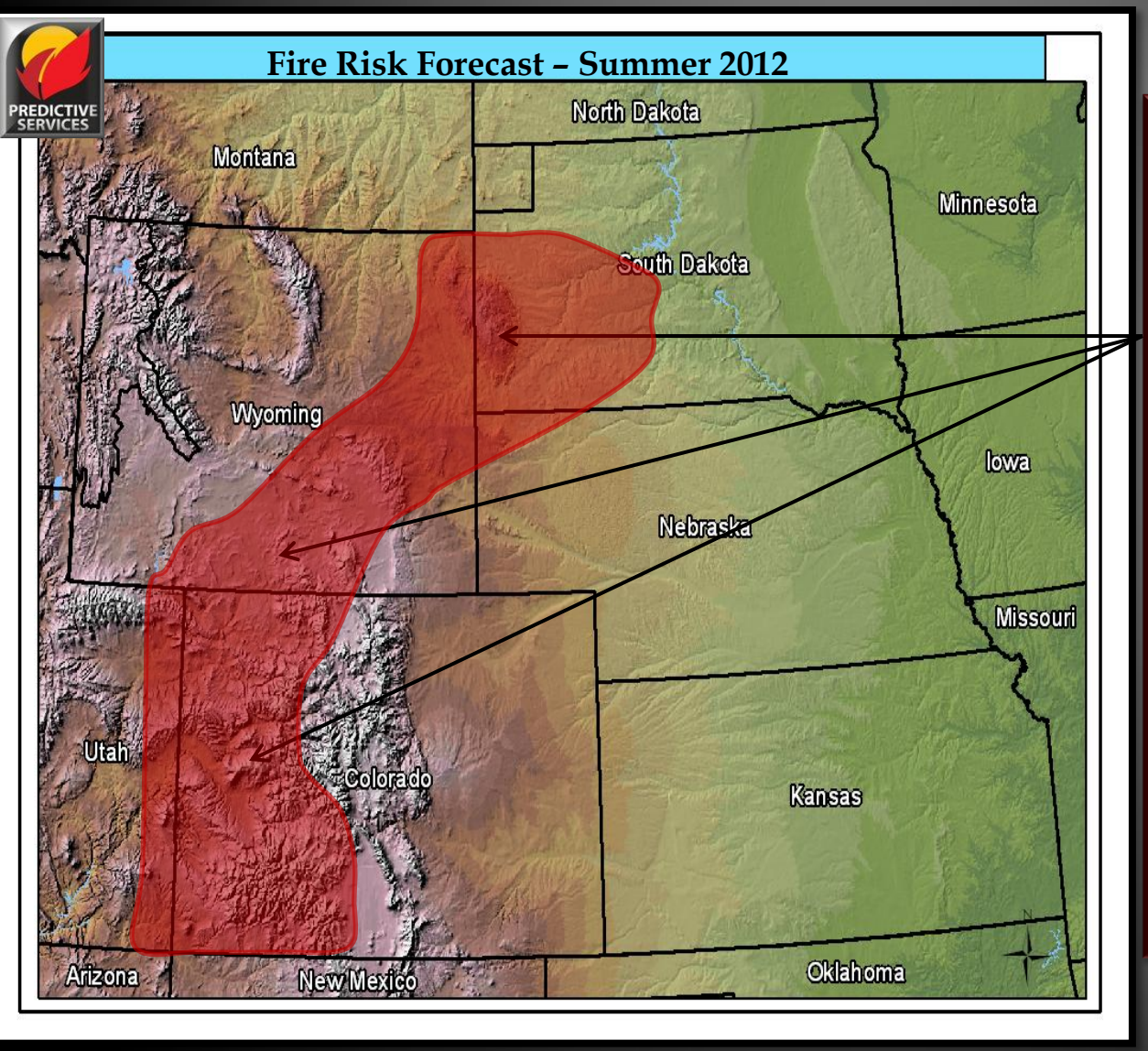
2013 Rocky Mountain Area Seasonal Outlook – April 2, 2013



Correspondence:
Tim Mathewson-RMCC Meteorologist
t2mathew@blm.gov

Seasonal Outlook

Summer 2012 Fire Risk Forecast Rewind (Issued April 2012)



Climate Variables

Snowpack Deficits
Precipitation Deficits
Above Average Temperatures
Drought Intensification
Wind

Though conditions in April are likely to improve, the May thru July outlooks support drier and warmer than average conditions

Heavy Fuel Types/Beds more susceptible to large fire this year then last.

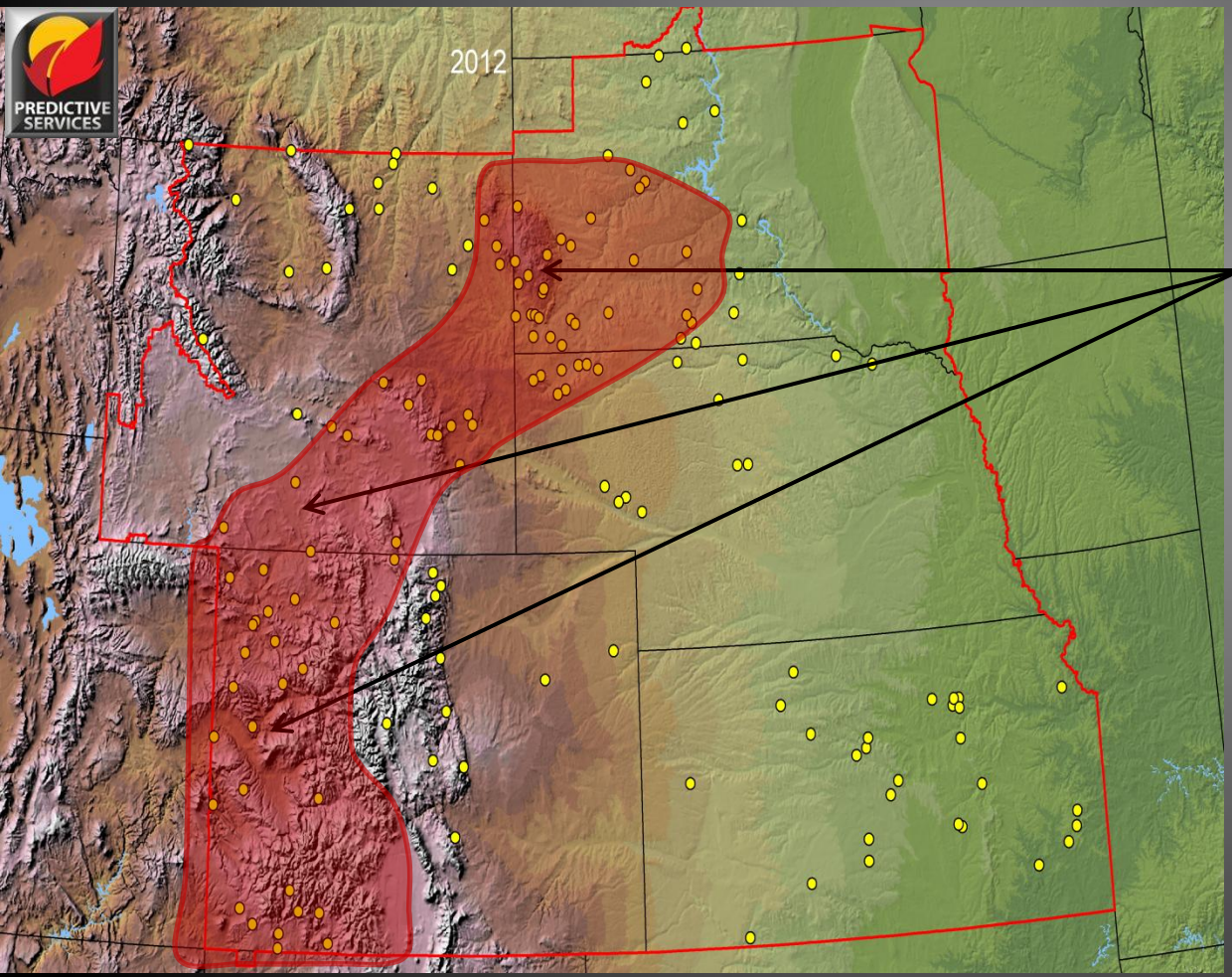
2012 Acres Burned < 2011

The next update to this outlook is scheduled for late April 2012.

Seasonal Outlook

Summer 2012 Fire Validation-Issued April 2012

Fire Risk Forecast Validation– Summer 2012 Issued April 2012



Climate Variables

Snowpack Deficits
Precipitation Deficits
Above Average Temperatures
Drought Intensification
Wind

Though conditions in April are likely to improve, the May thru July outlooks support drier and warmer than average conditions

Heavy Fuel Types/Beds more susceptible to large fire this year then last.

2012 Acres Burned < 2011

The next update to this outlook is scheduled for late April 2012.

Overlayed Large Fires with 2012 Early Season Forecast- Validation/Verification

Seasonal Outlook

Considerations

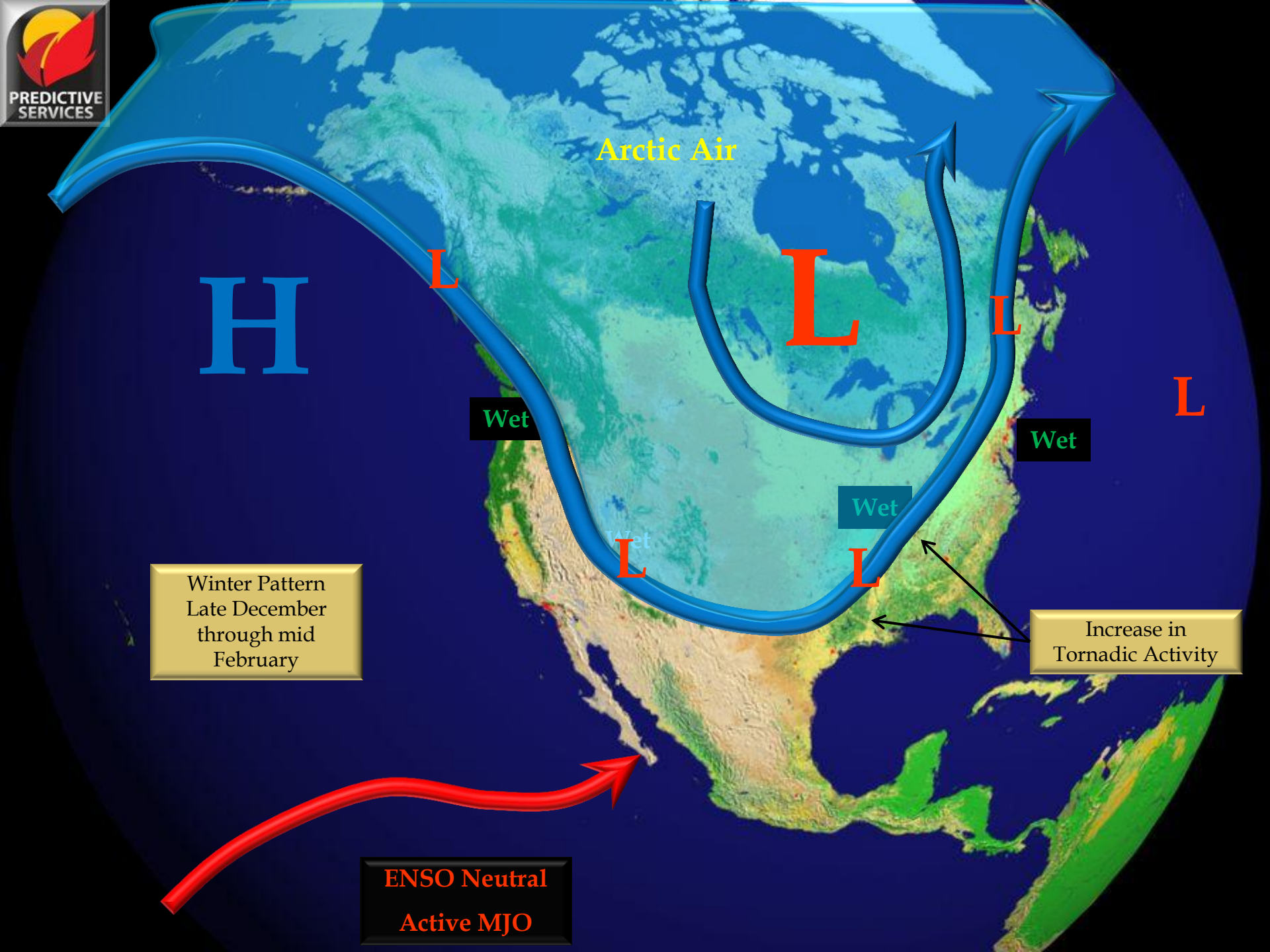
Antecedent Conditions

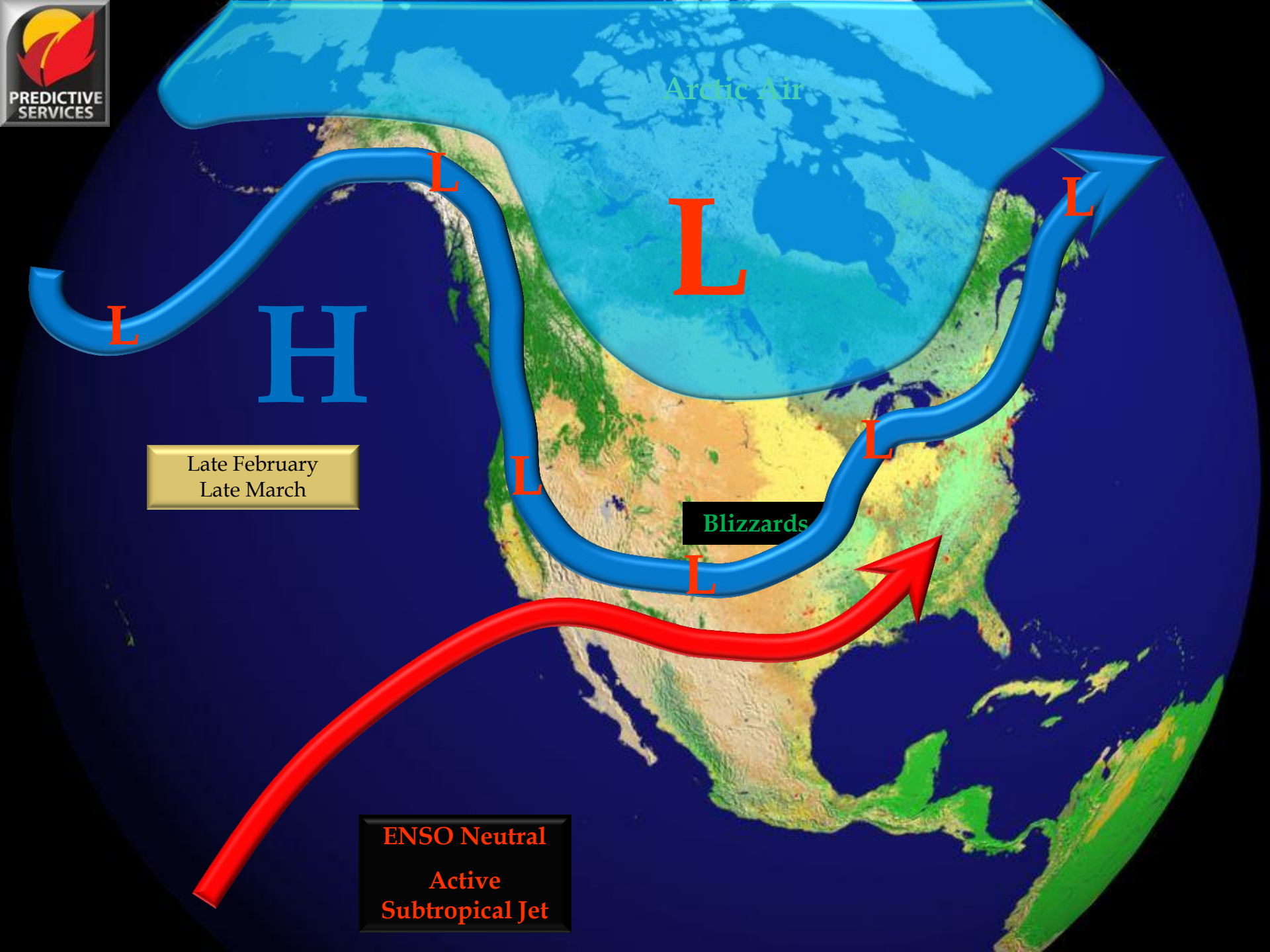
- 2012-2013 Fall, Winter, Early Spring Weather Patterns
- Temperature, RH and Wind 2012 vs. 2013
- March precipitation 2012 vs. 2013
- Drought 2012 vs. 2013
- Snowpack 2012 vs. 2013
- Fire Season Windows

Prediction

- Predictors
  - General SST Anomalies
  - ENSO
  - PDO
  - MJO
- ENSO Forecast
- RMA Fire History
- Long Range (Spring) Weather Outlooks and Considerations for the 2013 fire Season

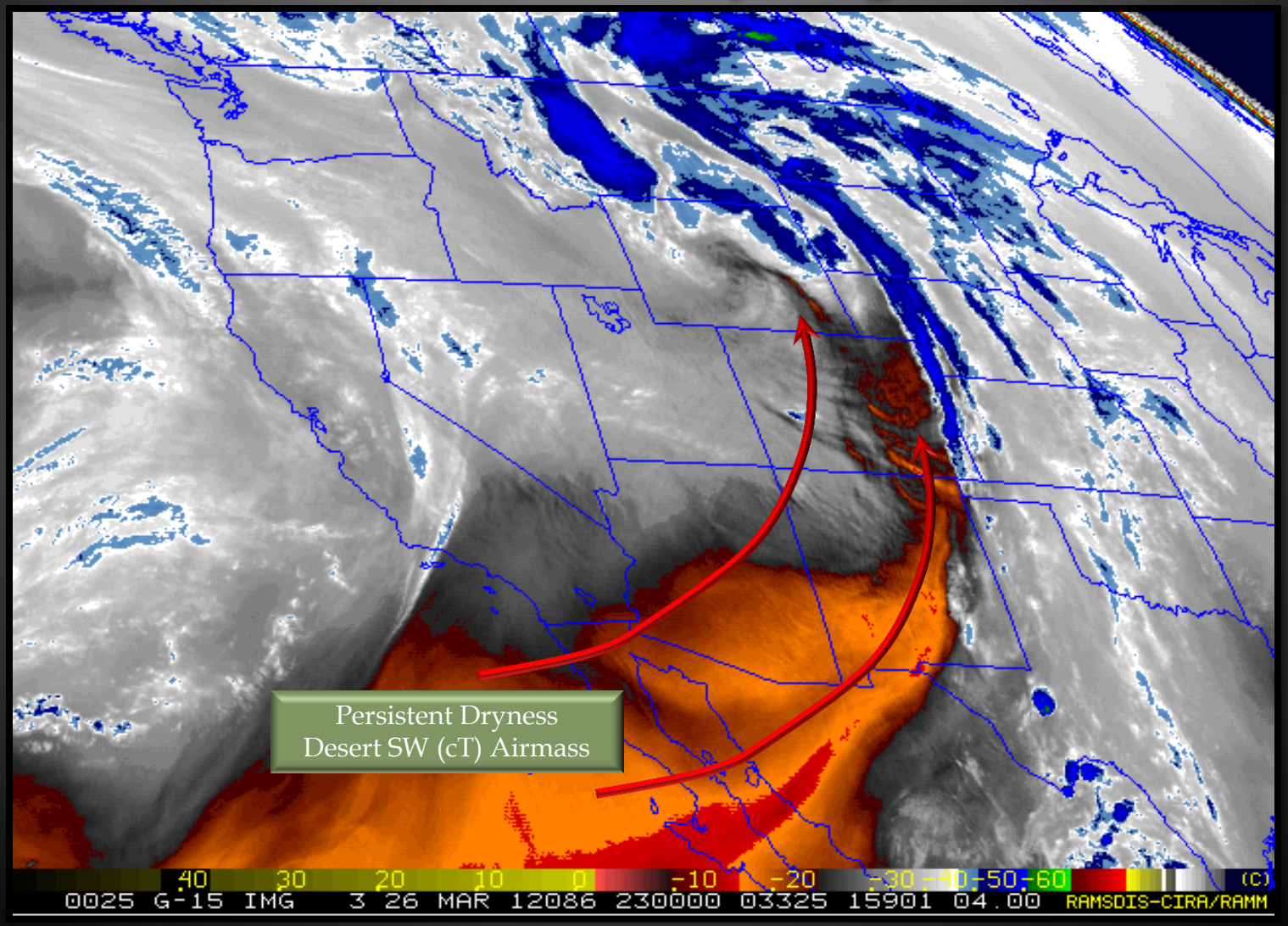

PREDICTIVE SERVICES
L
L
L
L
L
Wet
Wet
Dry
H
Fires
After an active weather pattern for the RMA in October
Persistent Dry Pattern in the Fall November-December
Positive SST
Weakening El Nino


PREDICTIVE SERVICES
Arctic Air
H
L
L
L
L
L
Wet
Wet
Wet
Wet
Winter Pattern
Late December
through mid
February
Increase in
Tornadic Activity
ENSO Neutral
Active MJO


PREDICTIVE SERVICES
Arctic Air
L
L
L
H
L
L
L
L
Late February
Late March
Blizzards
ENSO Neutral
Active
Subtropical Jet

Seasonal Outlook

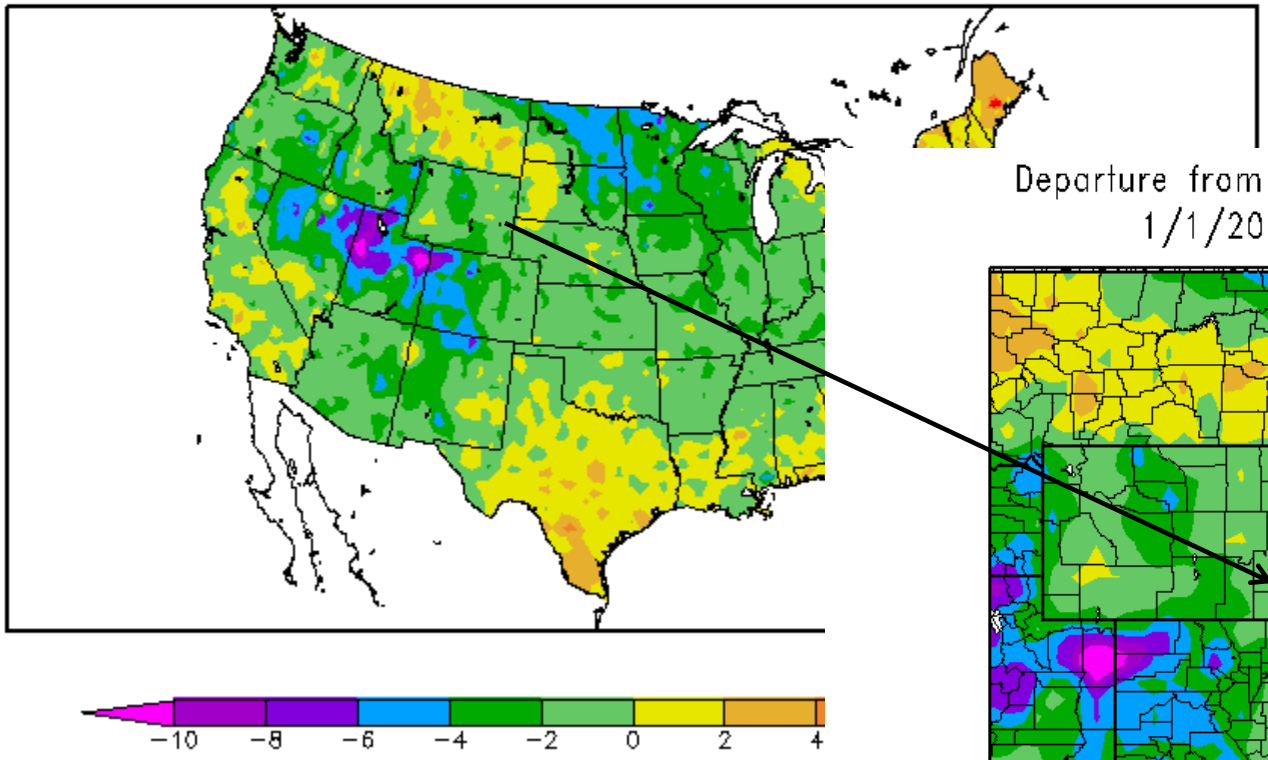
March 2012 (Spring 2012)



Seasonal Outlook

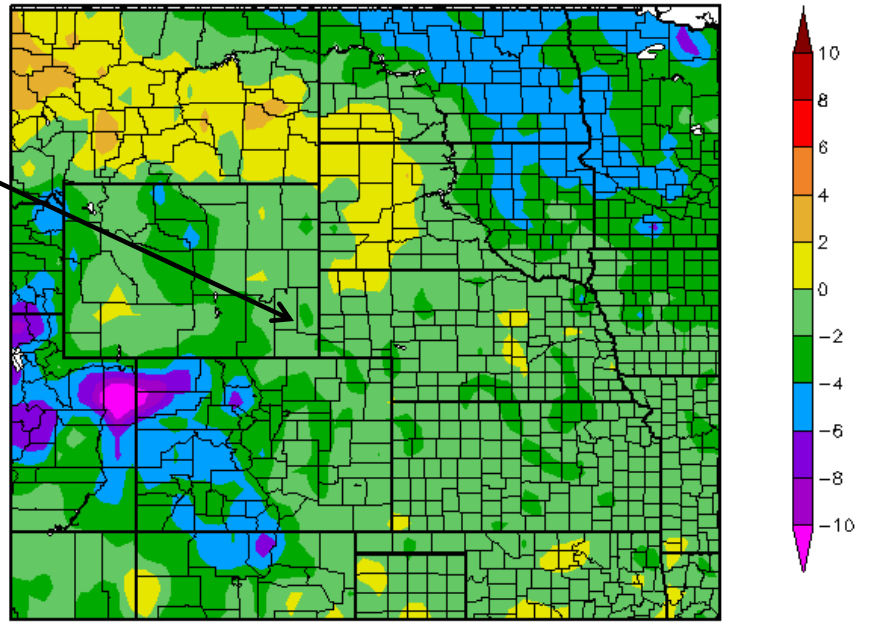
Temperature Departure from Normal Since Jan. 1, 2013

Departure from Normal Temperature (F)
1/1/2013 – 3/31/2013



Generated 4/1/2013 at HPRCC using provisional data.

Departure from Normal Temperature (F)
1/1/2013 – 3/31/2013



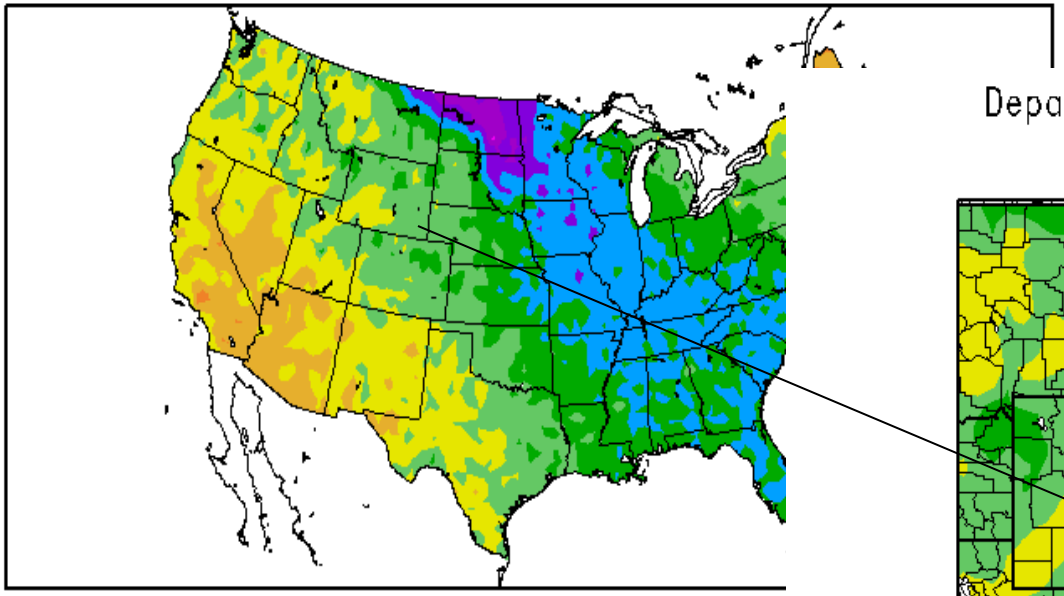
Generated 4/1/2013 at HPRCC using provisional data.

Regional Climate Centers

Seasonal Outlook

Temperature Departure from Normal Since Mar. 1, 2013

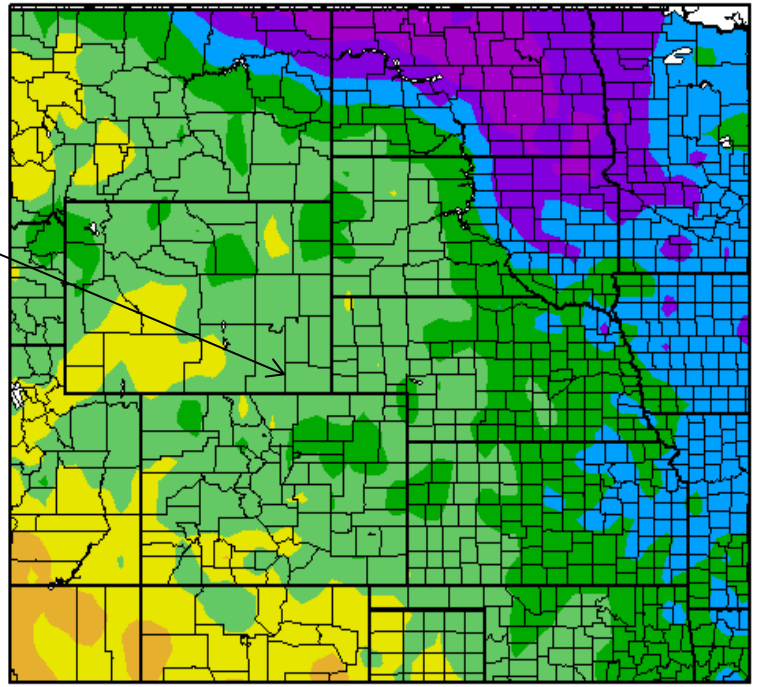
Departure from Normal Temperature (F)
3/1/2013 – 3/31/2013



−15 −12 −9 −6 −3 0 3 6 9

Generated 4/1/2013 at HPRCC using provisional data.

Departure from Normal Temperature (F)
3/1/2013 – 3/31/2013

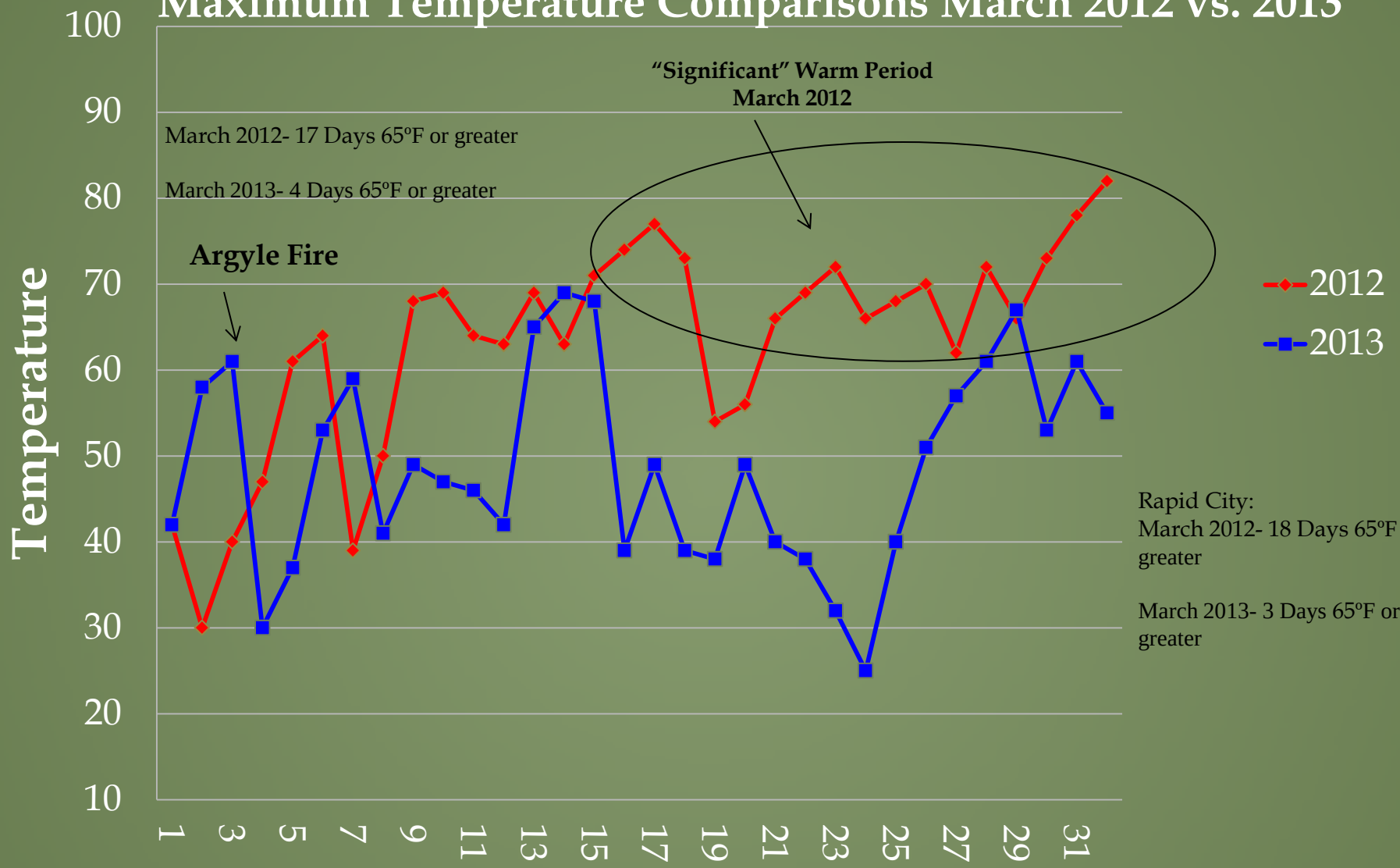


15 12 9 6 3 0 −3 −6 −9 −12 −15

Generated 4/1/2013 at HPRCC using provisional data.

Regional Climate Centers

Red Canyon RAWS (4644')
Maximum Temperature Comparisons March 2012 vs. 2013



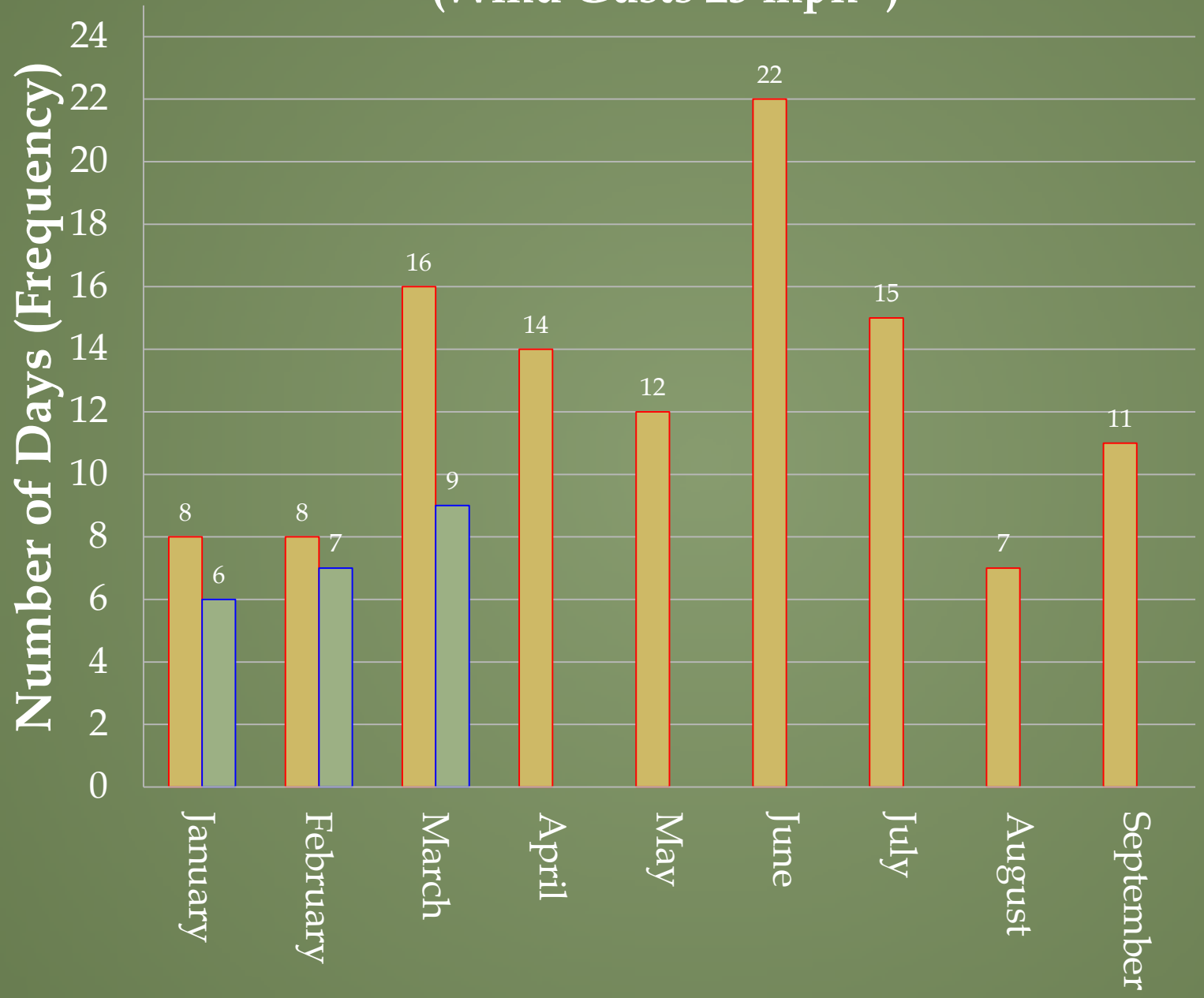
Rapid City:
March 2012- 18 Days 65ºF or greater

March 2013- 3 Days 65ºF or greater

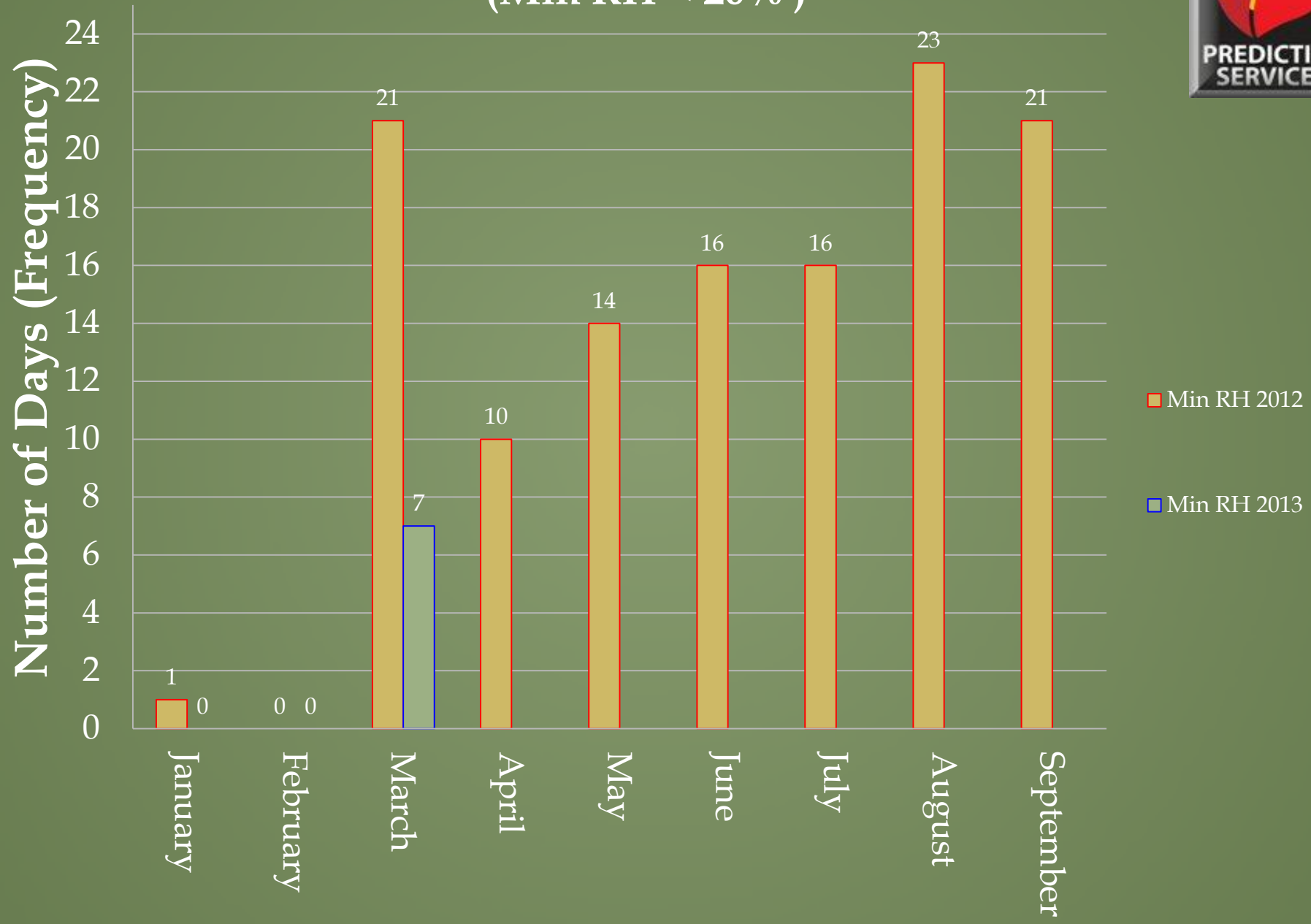
Overall, cooler temperatures are noted across South Dakota and Black Hills. Average maximum temperature in March 2012 for the Custer was 62.5°F. The average maximum temperature for March 2013 was 48.6°F.

PREDICTIVE SERVICES

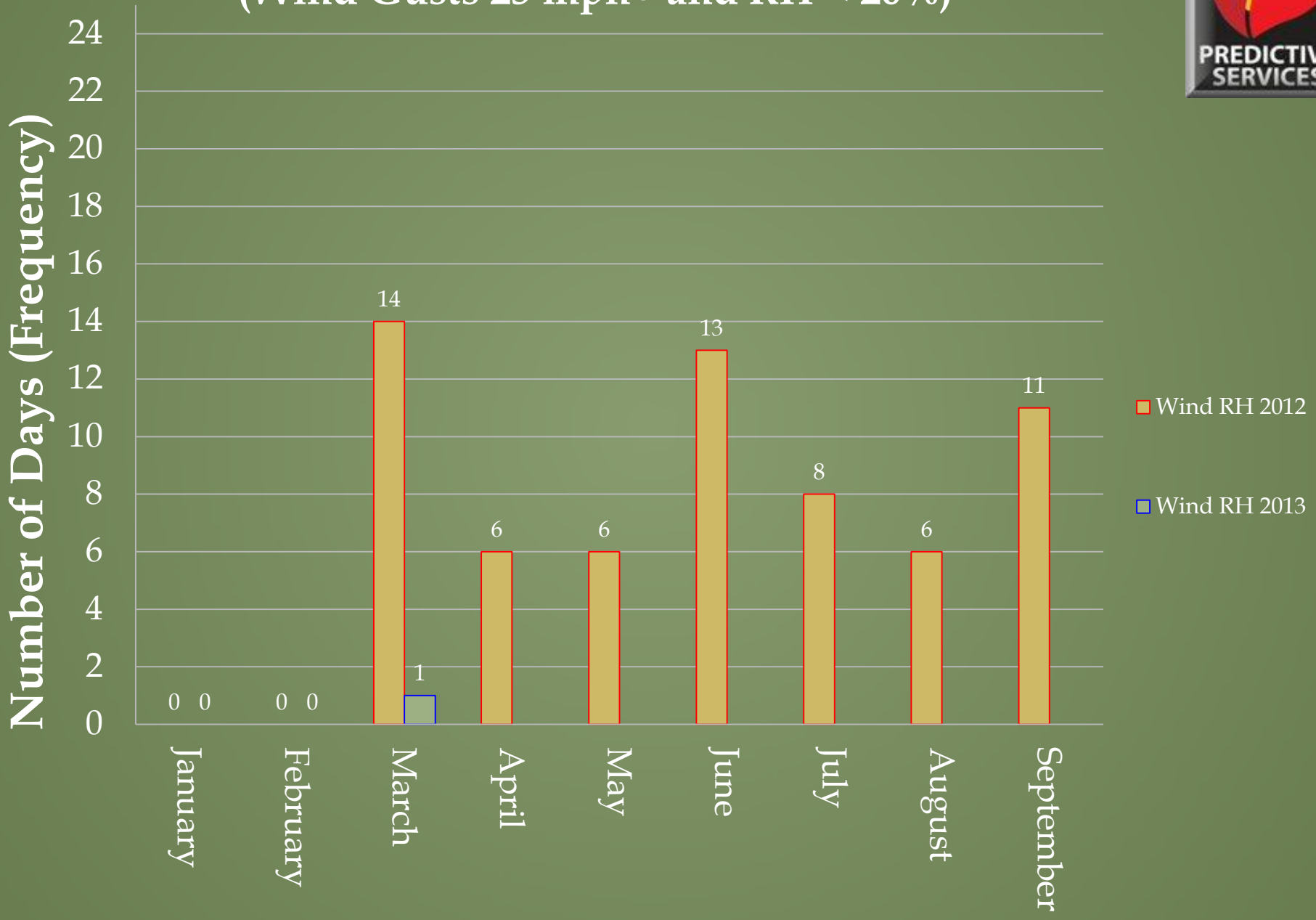
Red Canyon RAWS
(Wind Gusts 25 mph+)



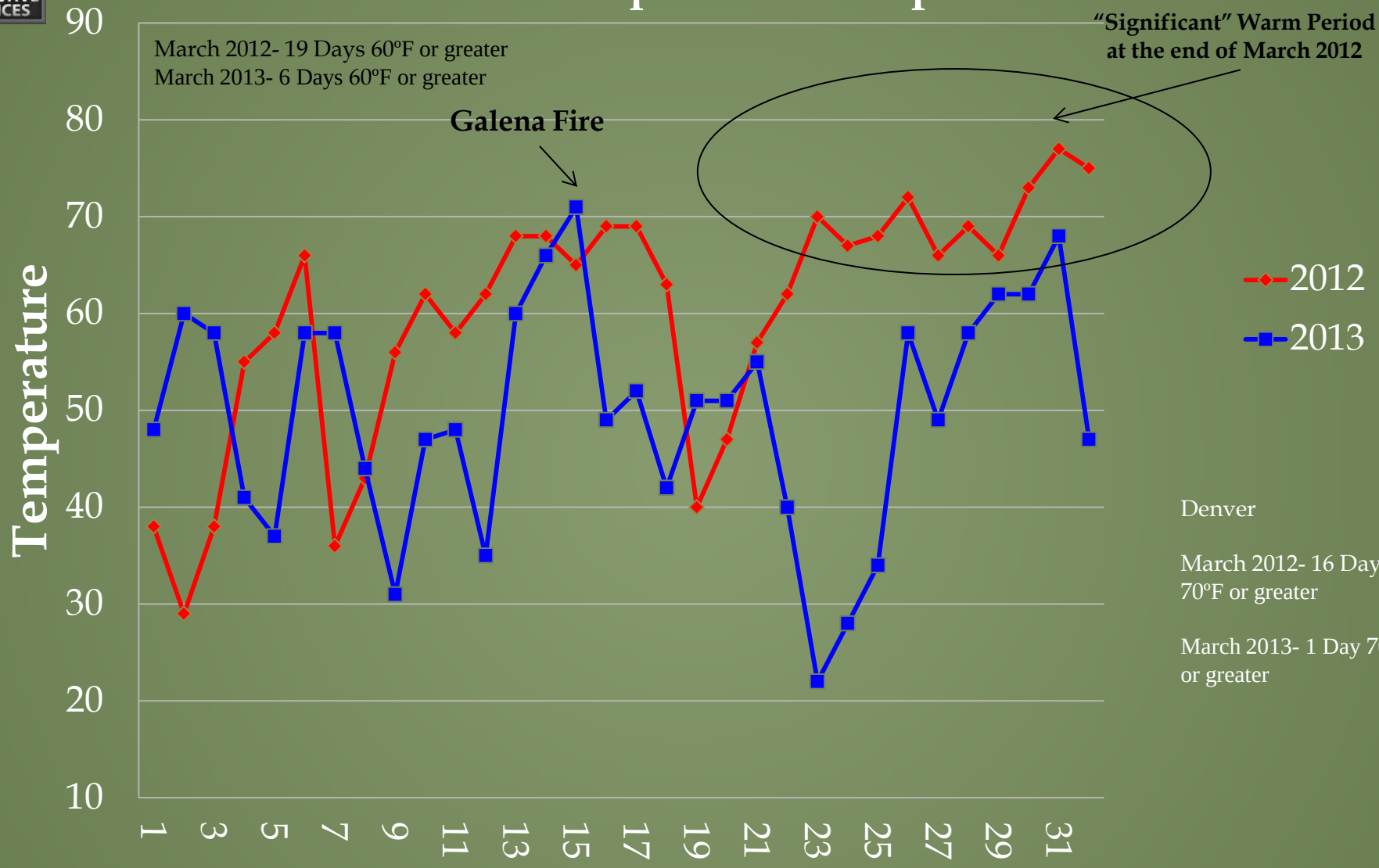
Red Canyon RAWS
(Min RH < 20%)



Red Canyon RAWS Wind-RH Index
(Wind Gusts 25 mph+ and RH < 20%)



Sugar Loaf RAWS (6733') March 2012 and March 2013 Maximum Temperature Comparisons



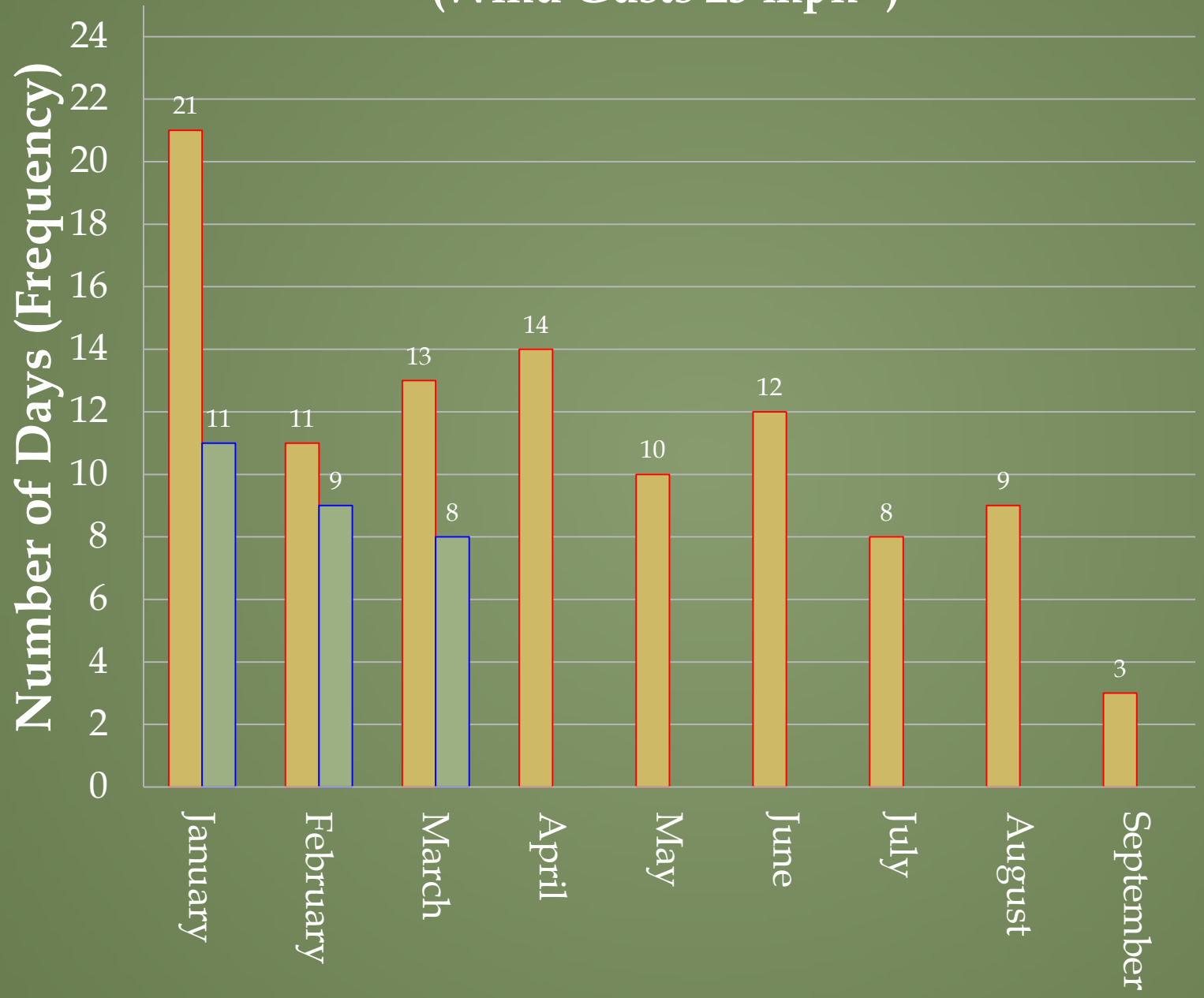
Denver

March 2012- 16 Days 70ºF or greater

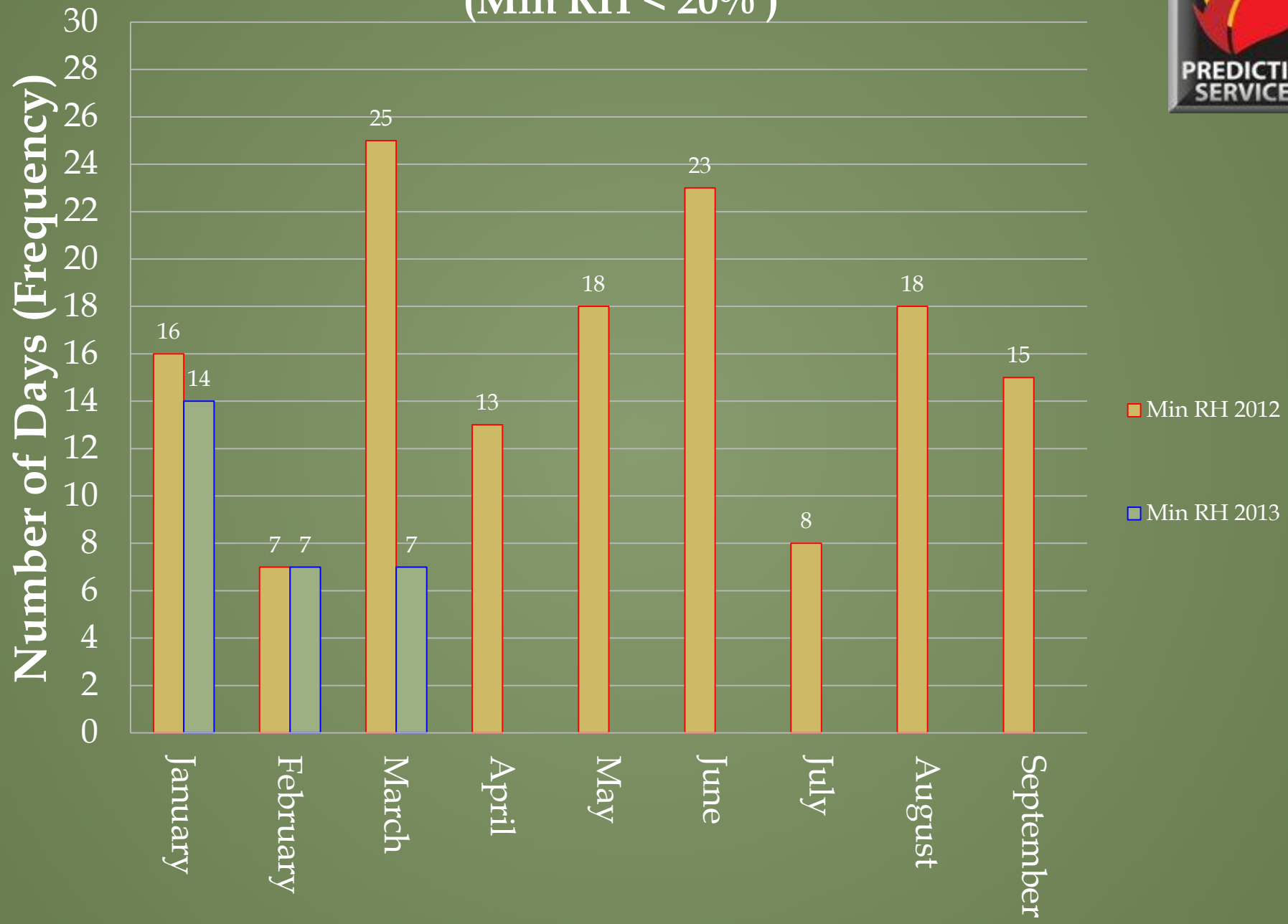
March 2013- 1 Day 70ºF or greater

Overall, cooler temperatures are noted across Colorado and Front Range. Average maximum temperature in March 2012 for the Sugar Loaf RAWS was 59.3°F. So far, the average maximum temperature for March 2013 is 49.3°F.

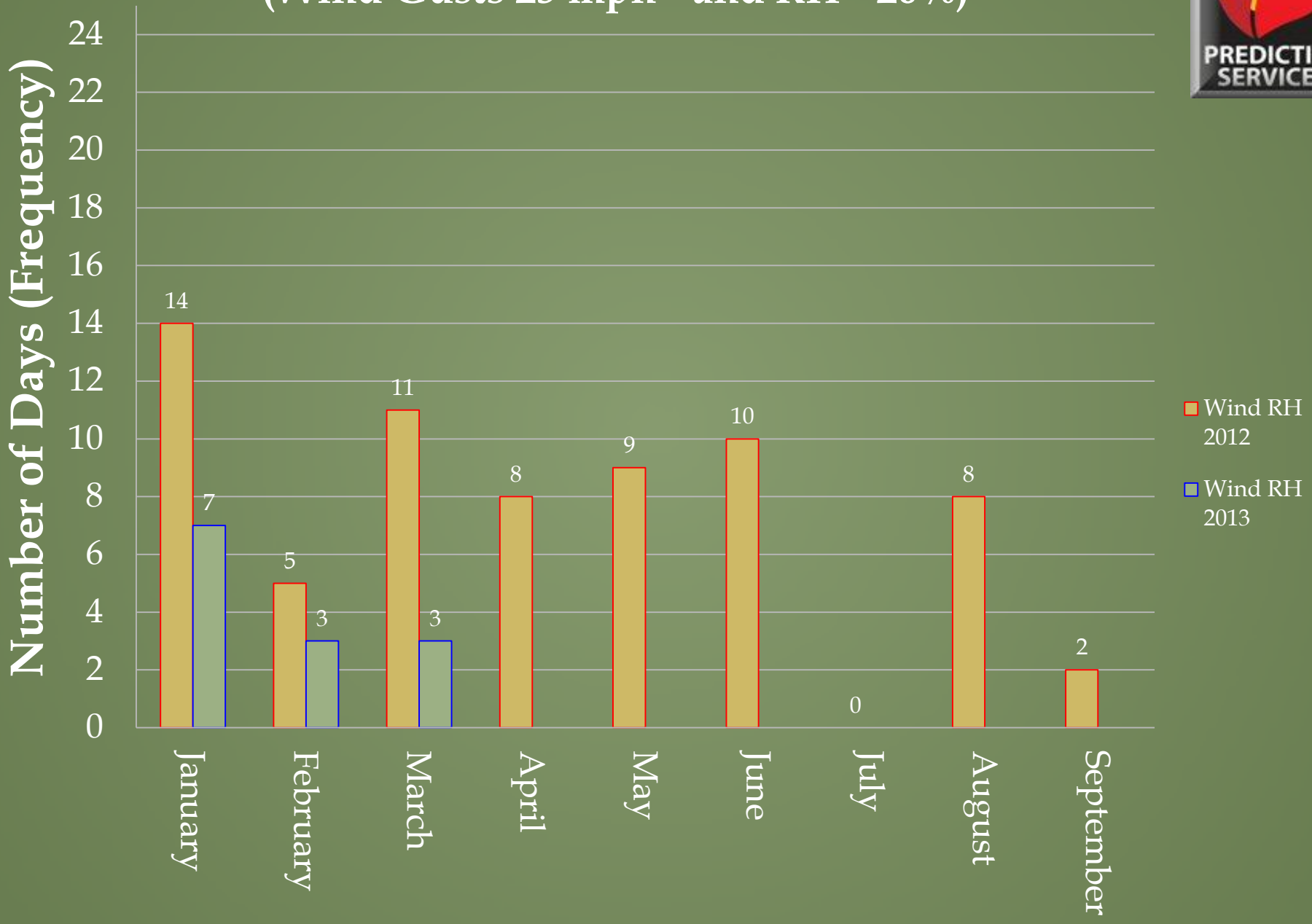
Sugar Loaf RAWS
(Wind Gusts 25 mph+)



Sugar Loaf RAWS
(Min RH < 20%)



Sugar Loaf RAWS Wind/RH Index
(Wind Gusts 25 mph+ and RH <20%)



Seasonal Outlook

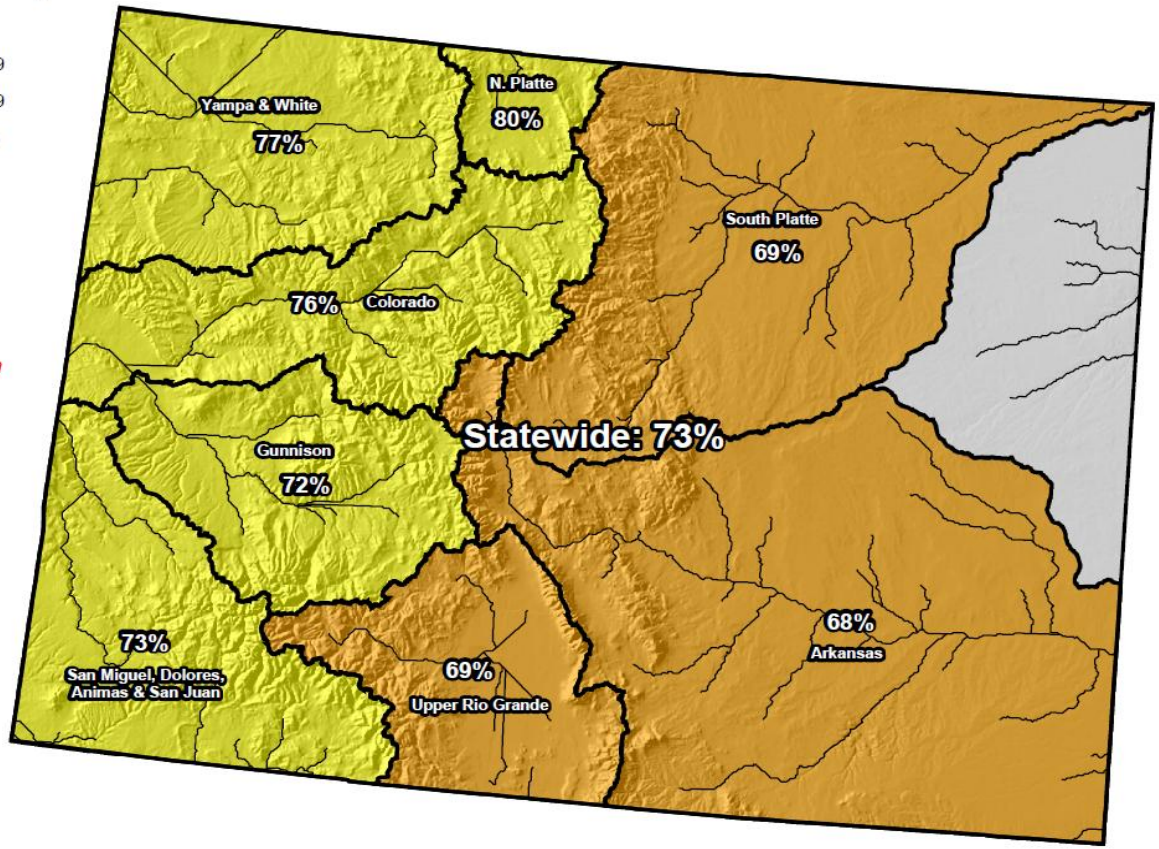
Colorado Snowpack- April 1, 2013

Colorado SNOTEL Snowpack Update Map

Percent of Average

- >= 150
- 130 - 149
- 110 - 129
- 90 - 109
- 70 - 89
- 50 - 69
- < 50

Provisional Data Subject to Revision



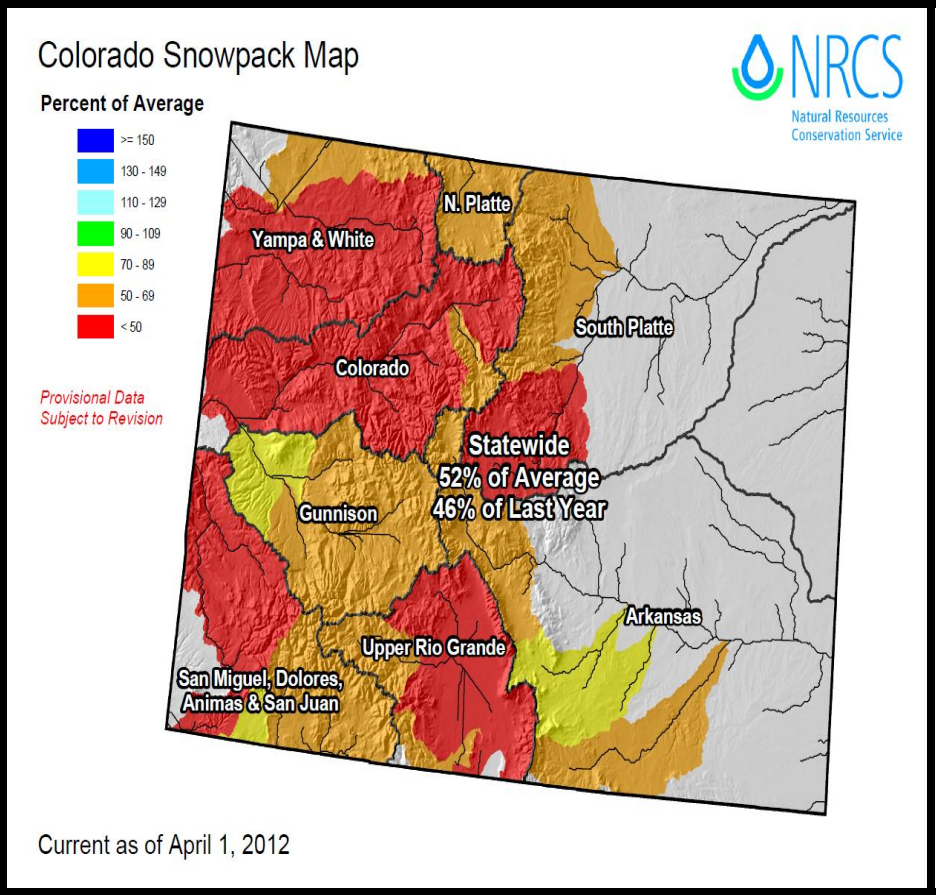
Current as of Apr 01, 2013

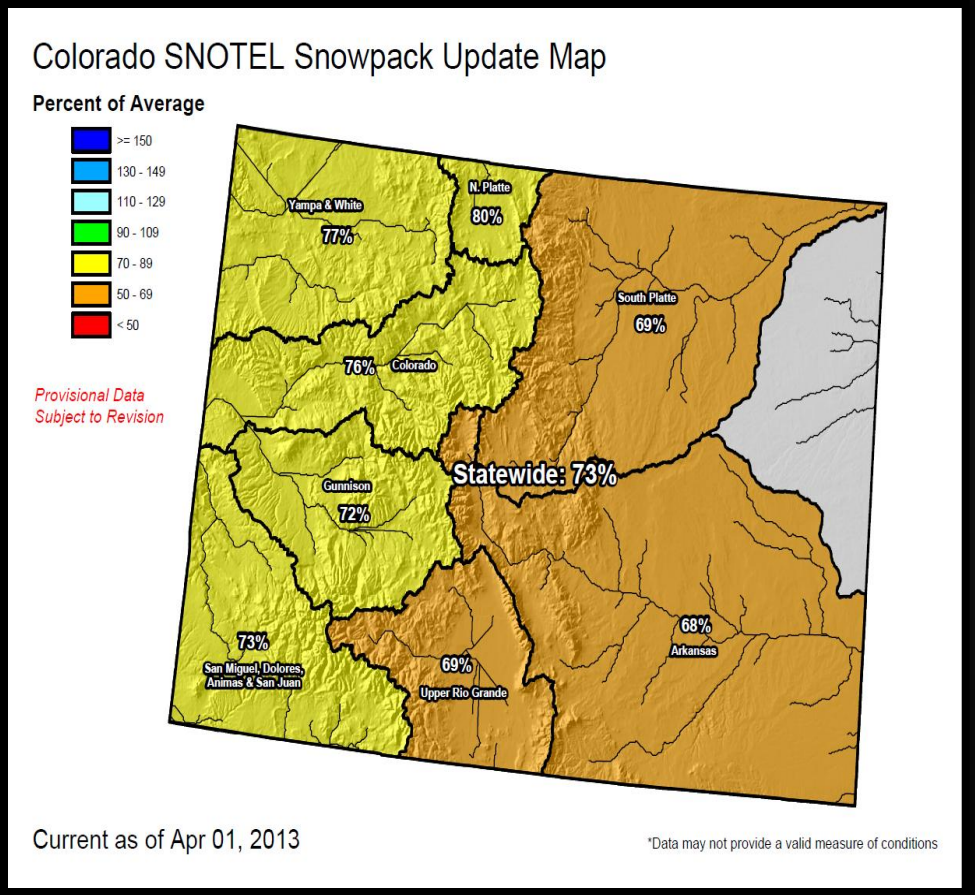
*Data may not provide a valid measure of conditions

Developed by NRCS

Seasonal Outlook

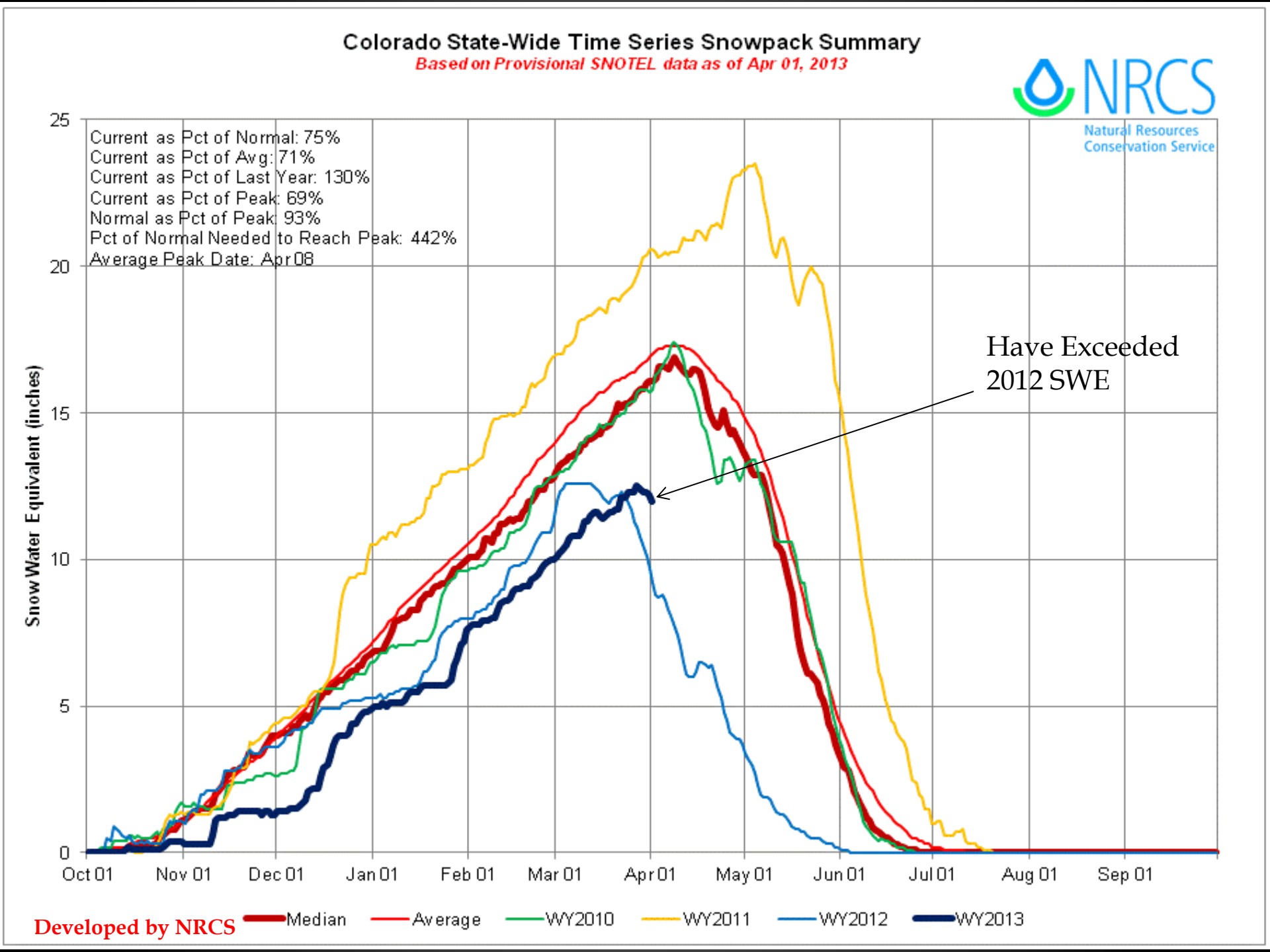
Colorado Snowpack
April 1, 2012 vs. April 1, 2013





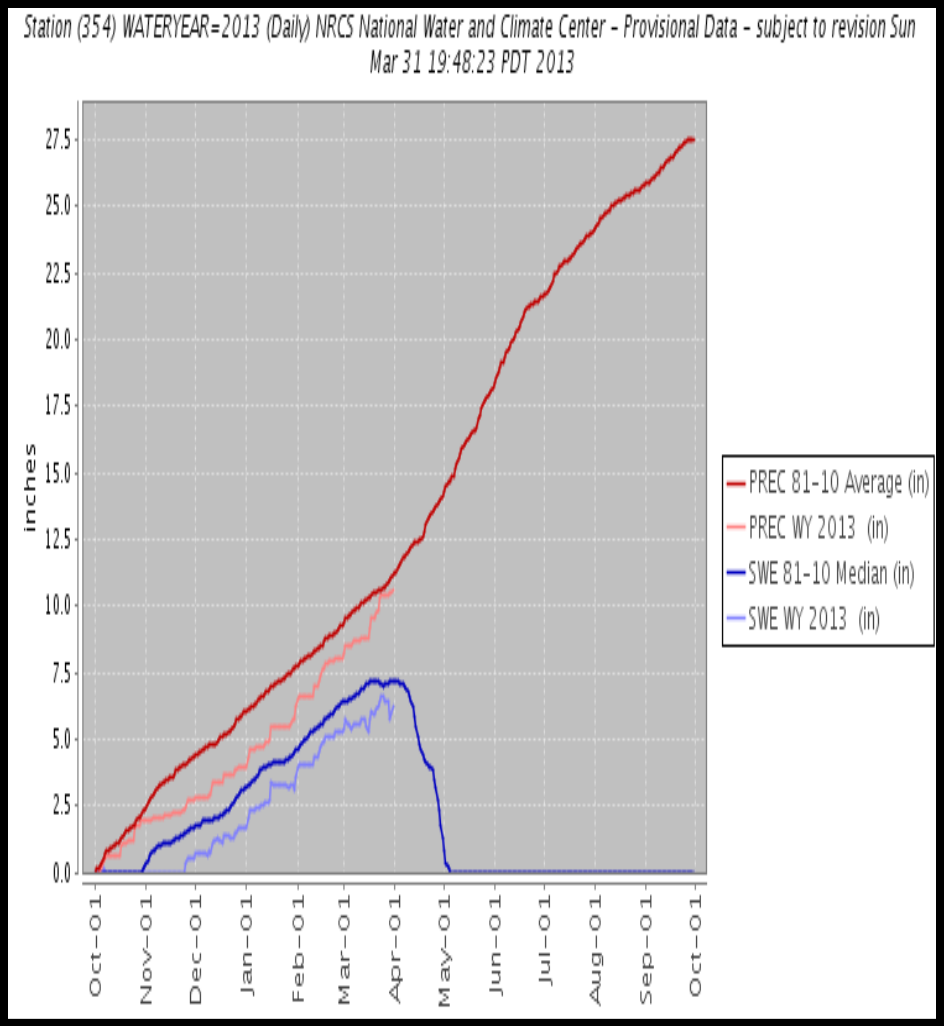
A significant depletion of snowpack occurred at the end of March 2012, leaving April 1, 2012 snowpack values at 52% of average (left). Though below average April 1, 2013 snowpack will be better than last year at this time.

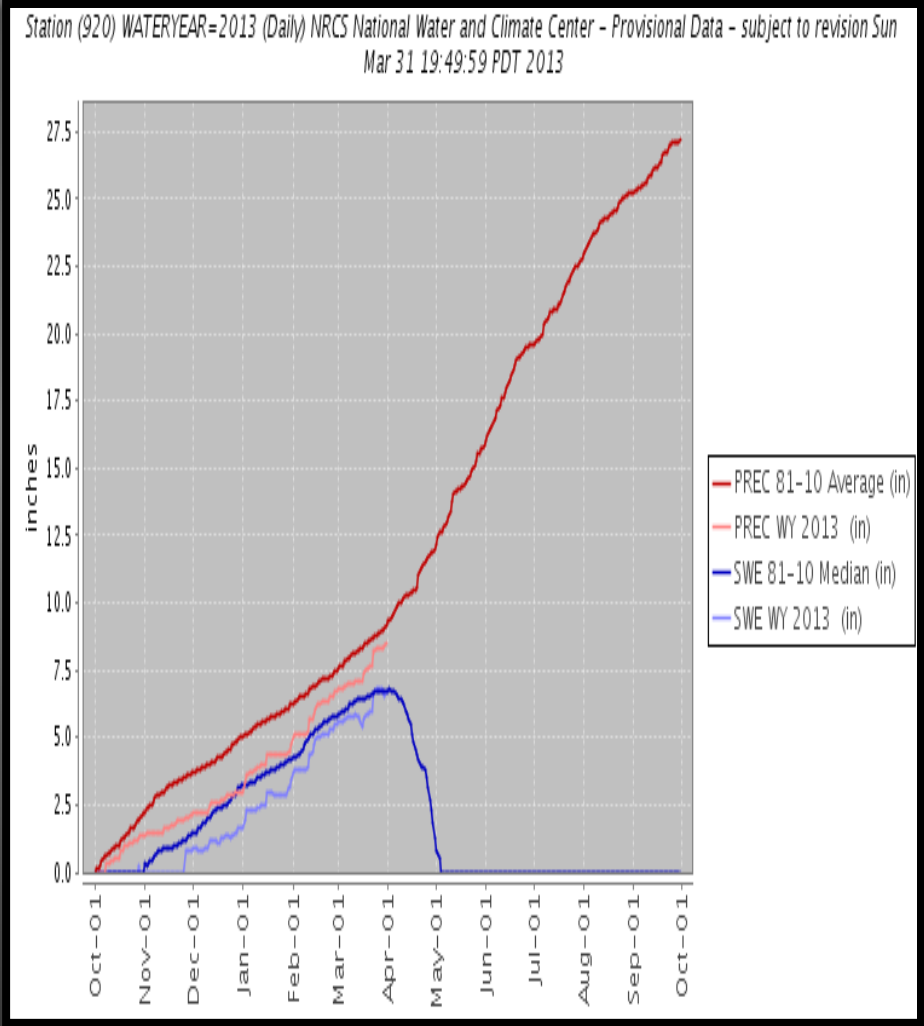
Developed by NRCS


Colorado State-Wide Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 01, 2013
NRCS
Natural Resources Conservation Service
Current as Pct of Normal: 75%
Current as Pct of Avg: 71%
Current as Pct of Last Year: 130%
Current as Pct of Peak: 69%
Normal as Pct of Peak: 93%
Pct of Normal Needed to Reach Peak: 442%
Average Peak Date: Apr 08
Have Exceeded 2012 SWE
Snow Water Equivalent (inches)
25
20
15
10
5
0
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Median
Average
WY2010
WY2011
WY2012
WY2013
Developed by NRCS

Seasonal Outlook

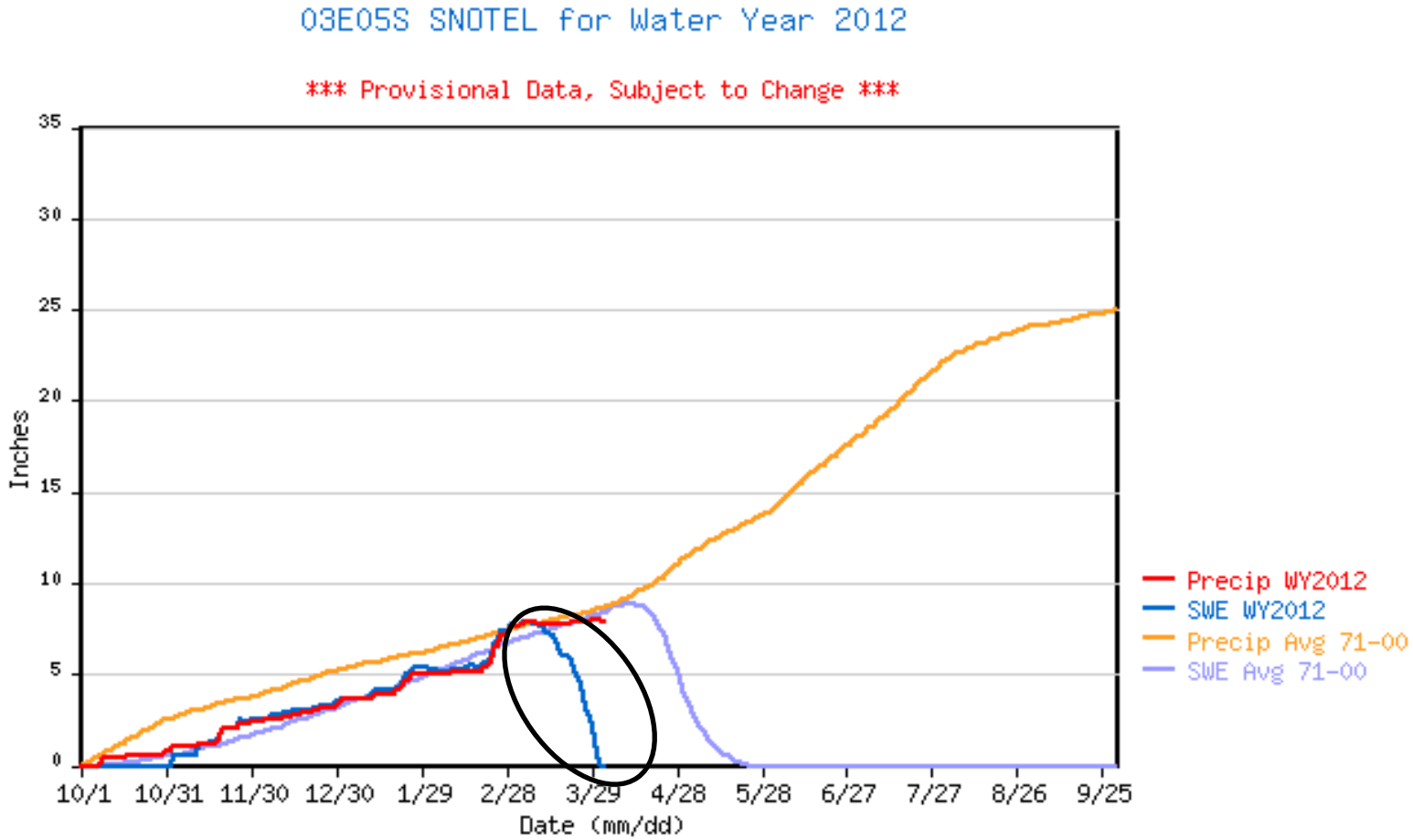
South Dakota Snowpack- March 31, 2013





Seasonal Outlook

South Dakota Snowpack (2012)

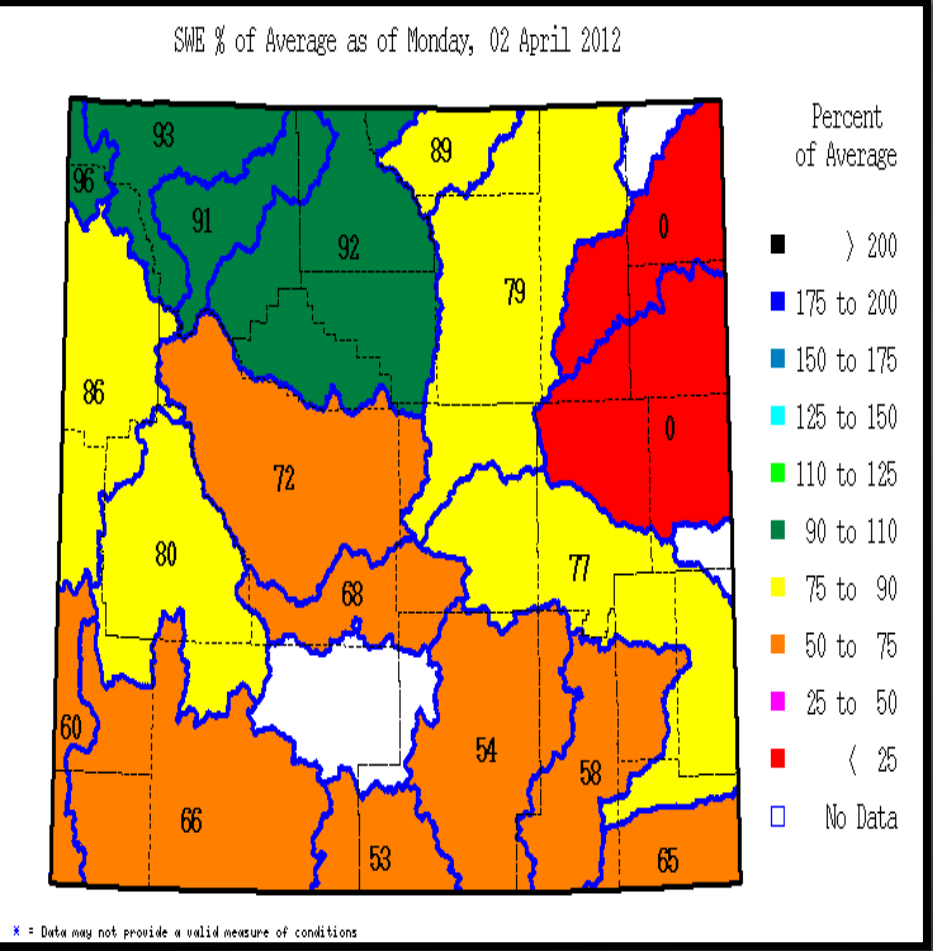


Developed by NRCS

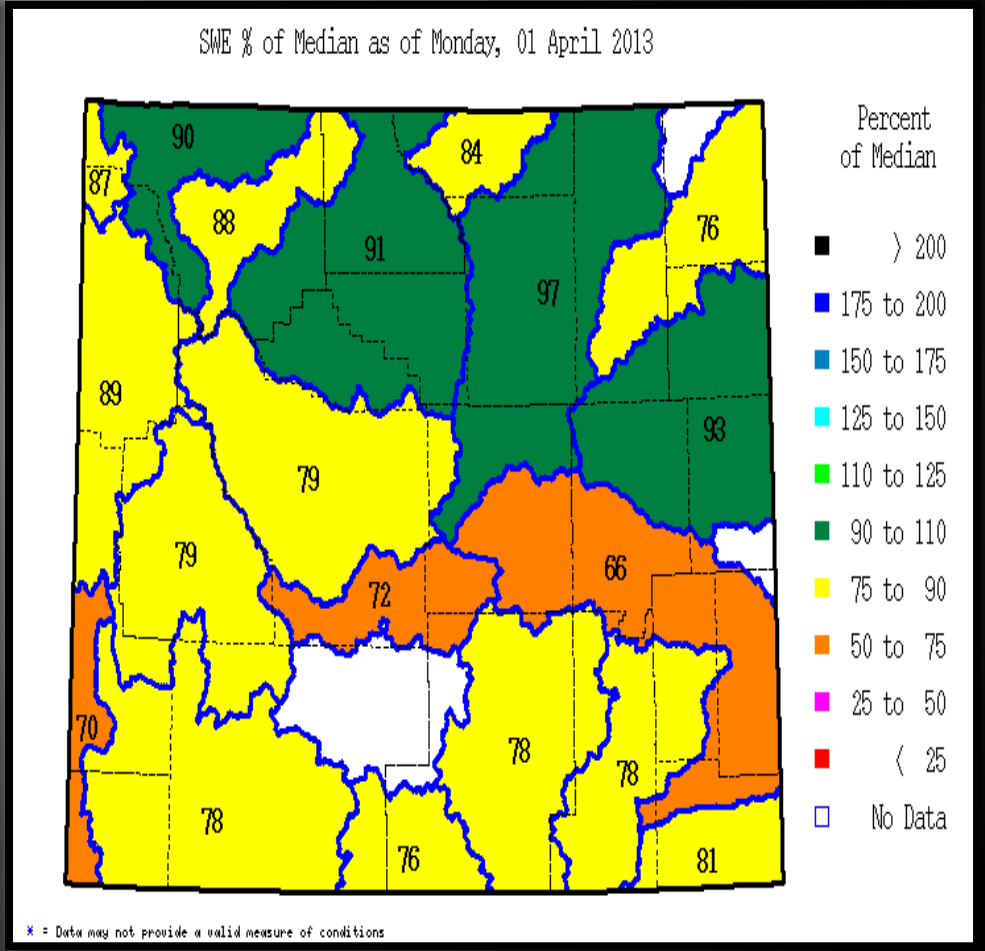
Seasonal Outlook

Wyoming Snowpack April 2012 vs April 2013

Developed by NRCS



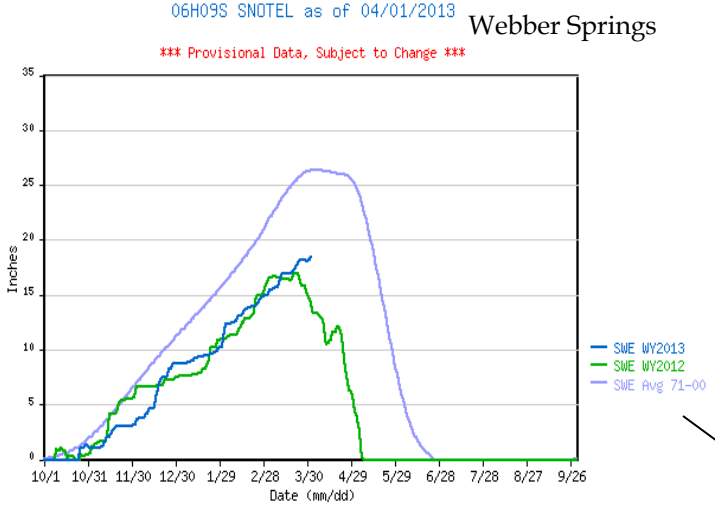
Using the old 30 year average (71-00)



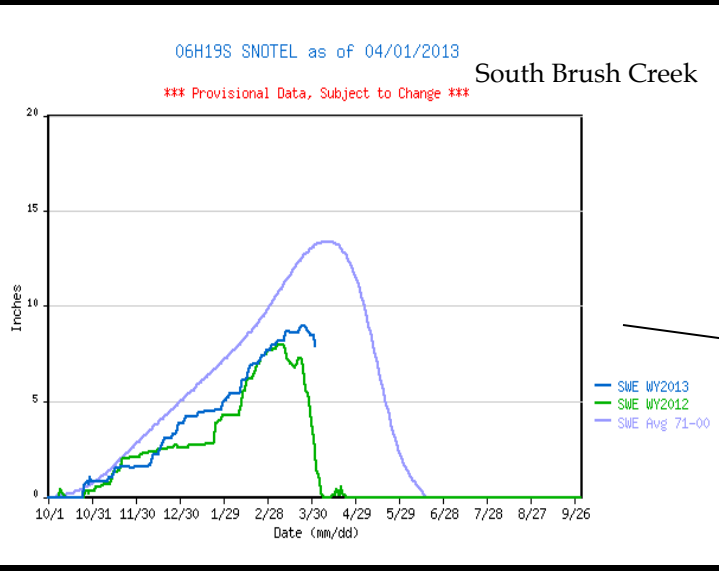
Using the new 30 year average (81-10)

Seasonal Outlook

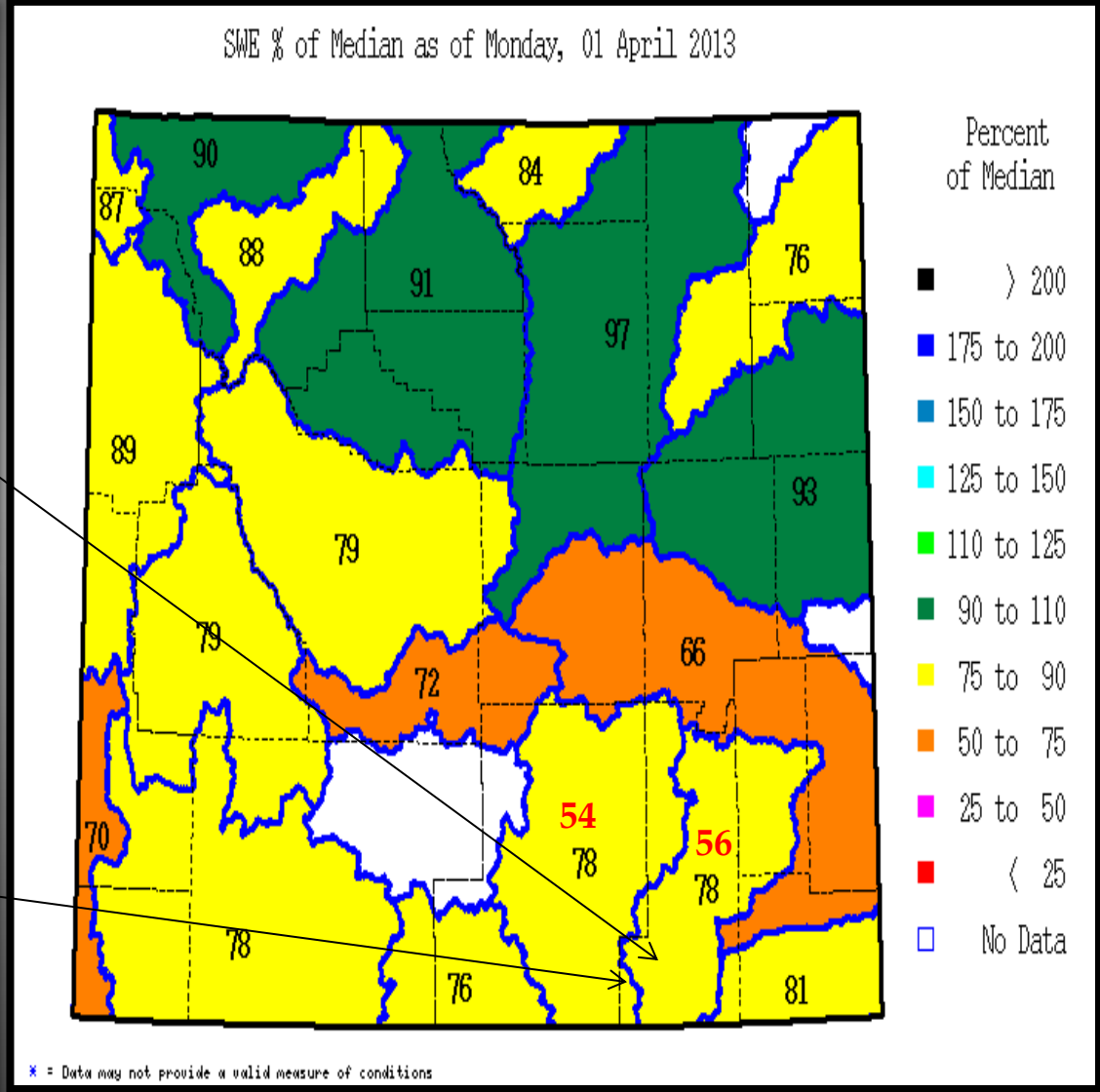
Wyoming Snowpack-



Webber Springs

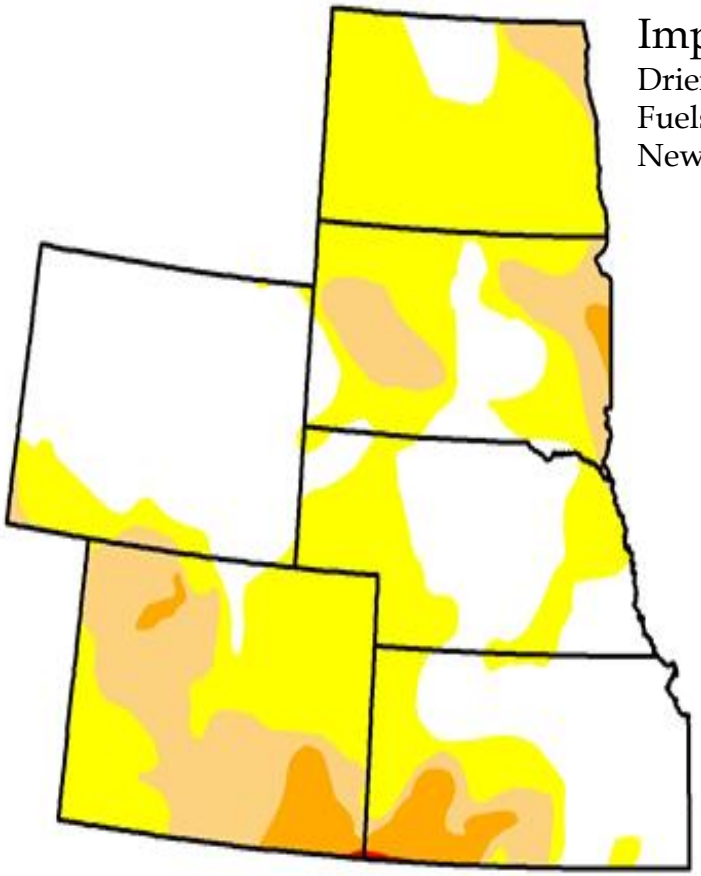


South Brush Creek

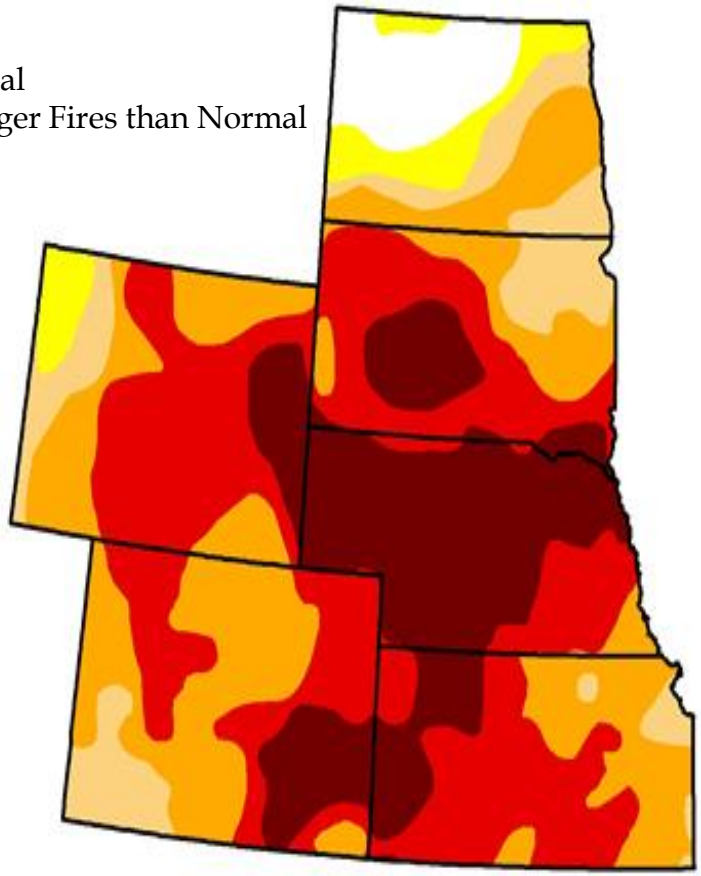


Seasonal Outlook

Regional Drought Monitor



March 27, 2012



March 26, 2013

Impacts:

Drier Fuels than Normal

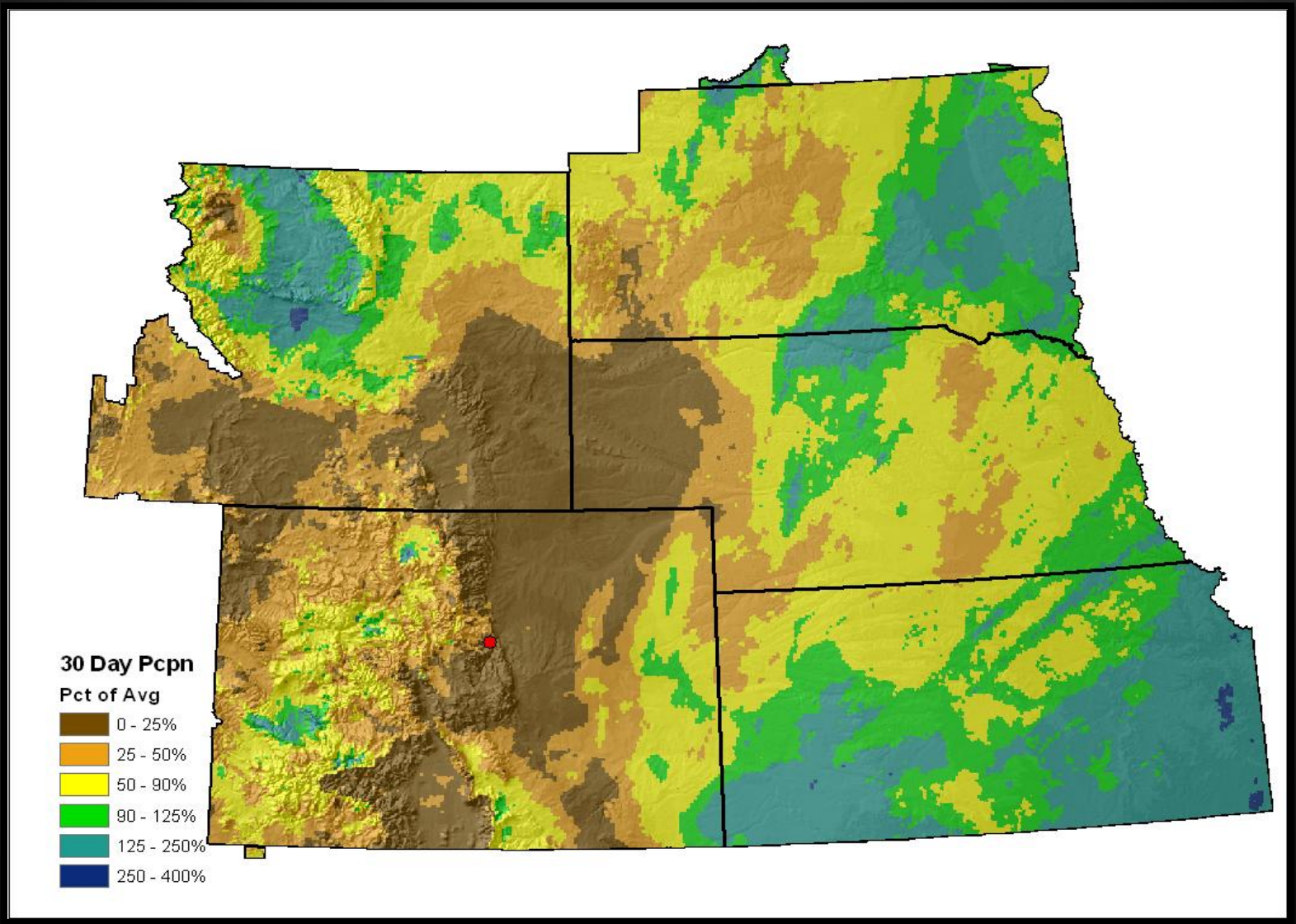
Fuels that Support Larger Fires than Normal

New Grass Crop?

Abnormally Dry | Moderate | Severe | Extreme | Exceptional

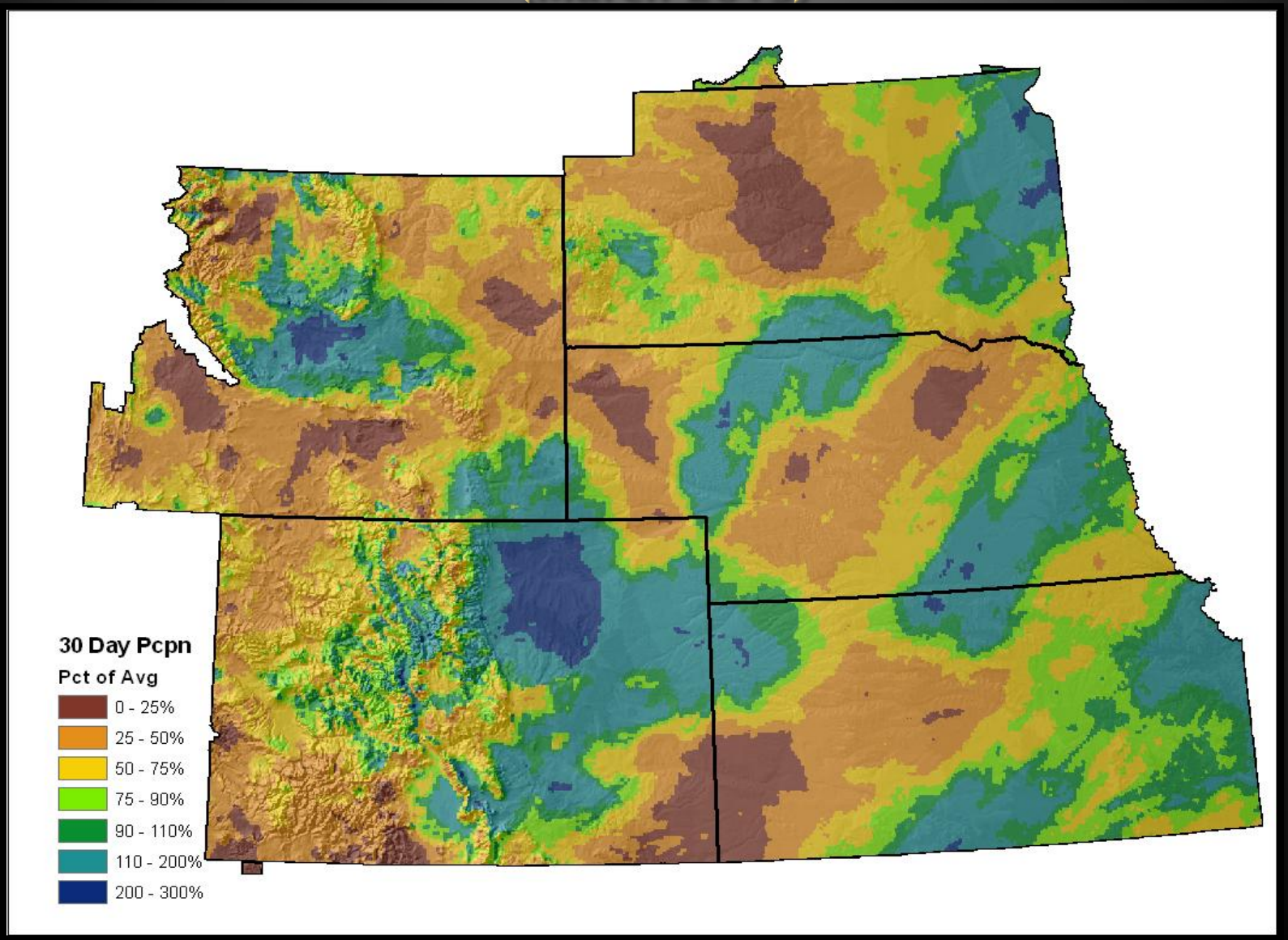
Seasonal Outlook

RMA 30-Day Percent of Normal Precipitation (March 2012)



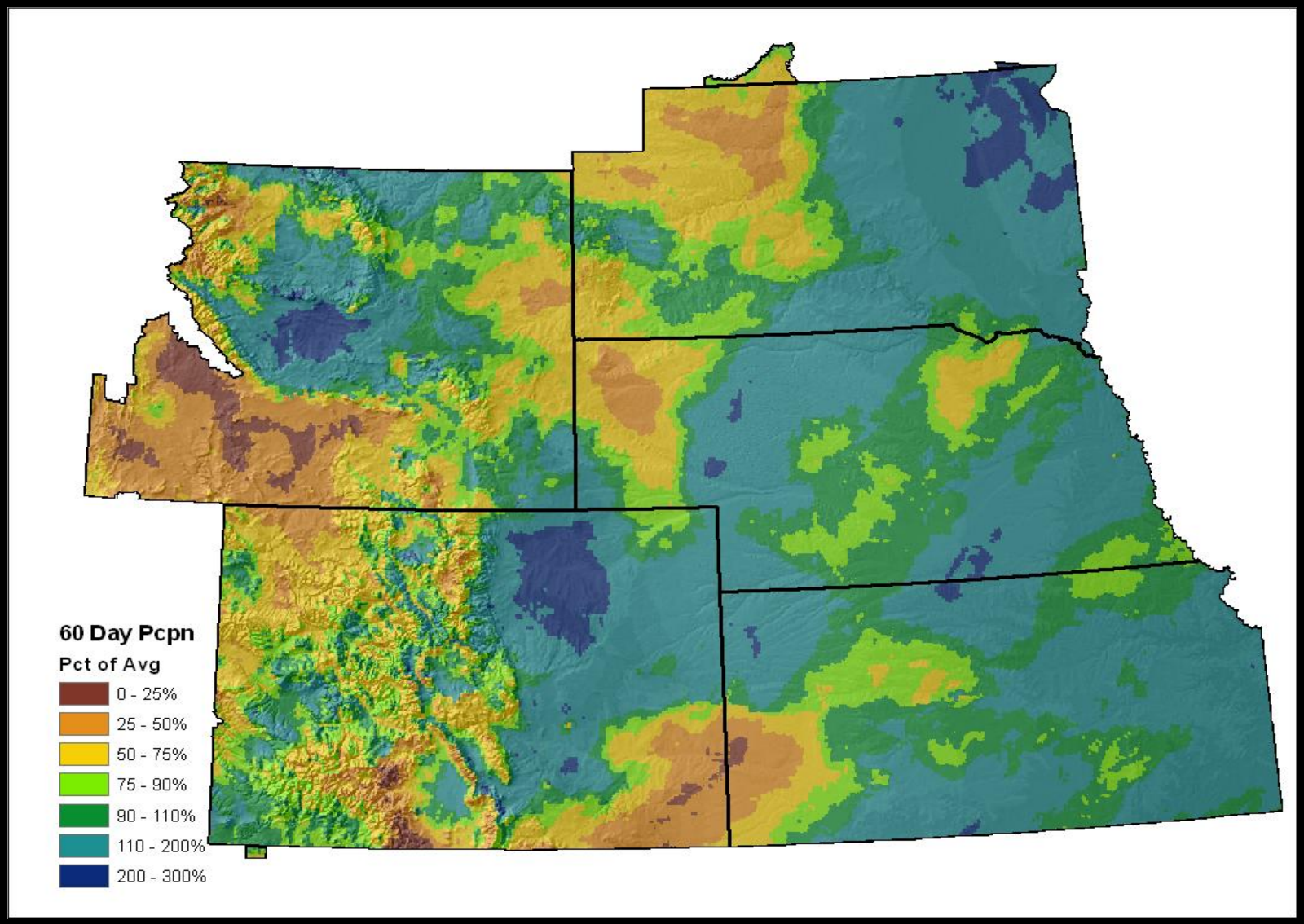
Seasonal Outlook

RMA 30-Day Percent of Normal Precipitation (March 2013)



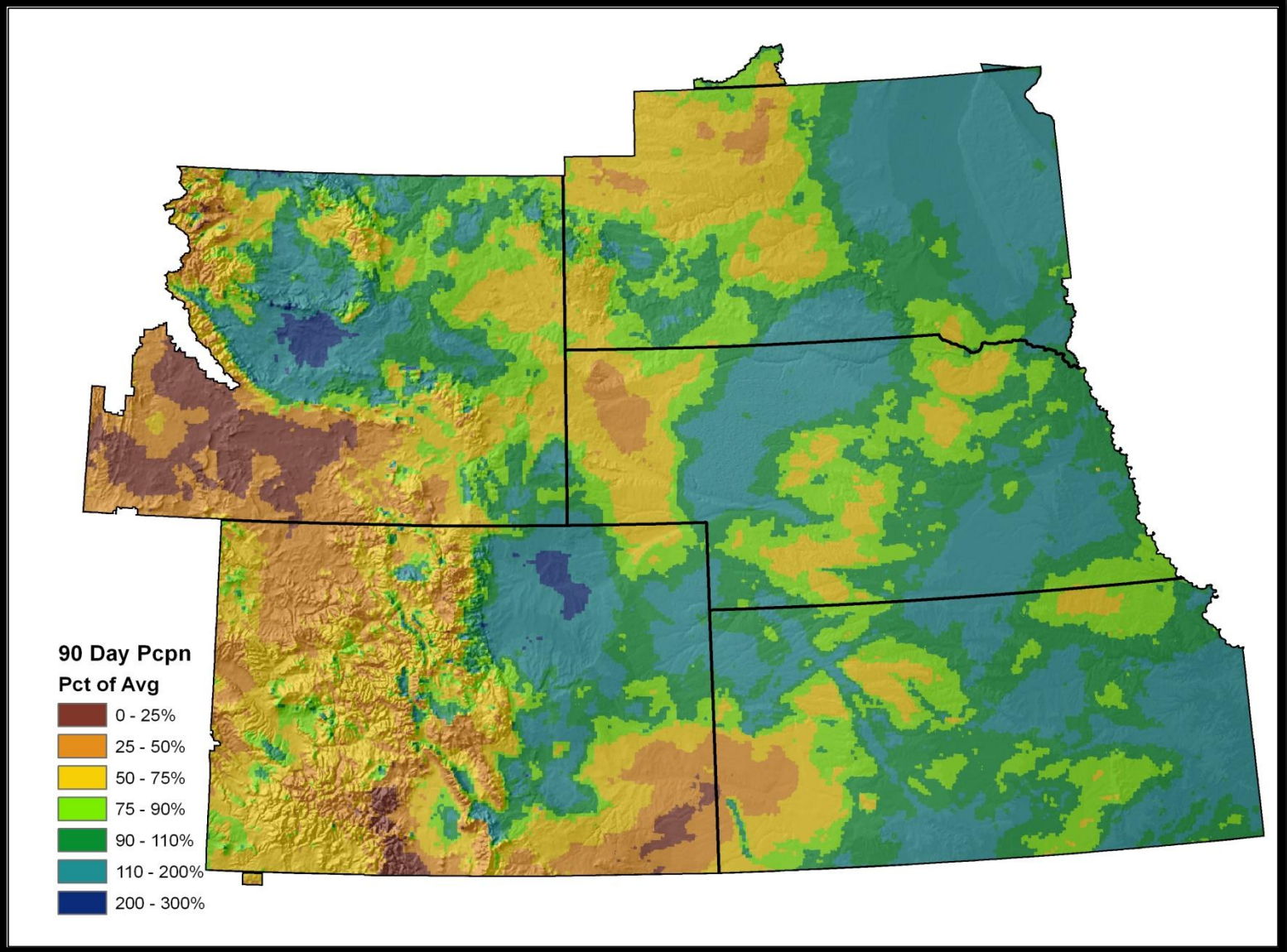
Seasonal Outlook

RMA 60-Day Percent of Normal Precipitation (February and March 2013)



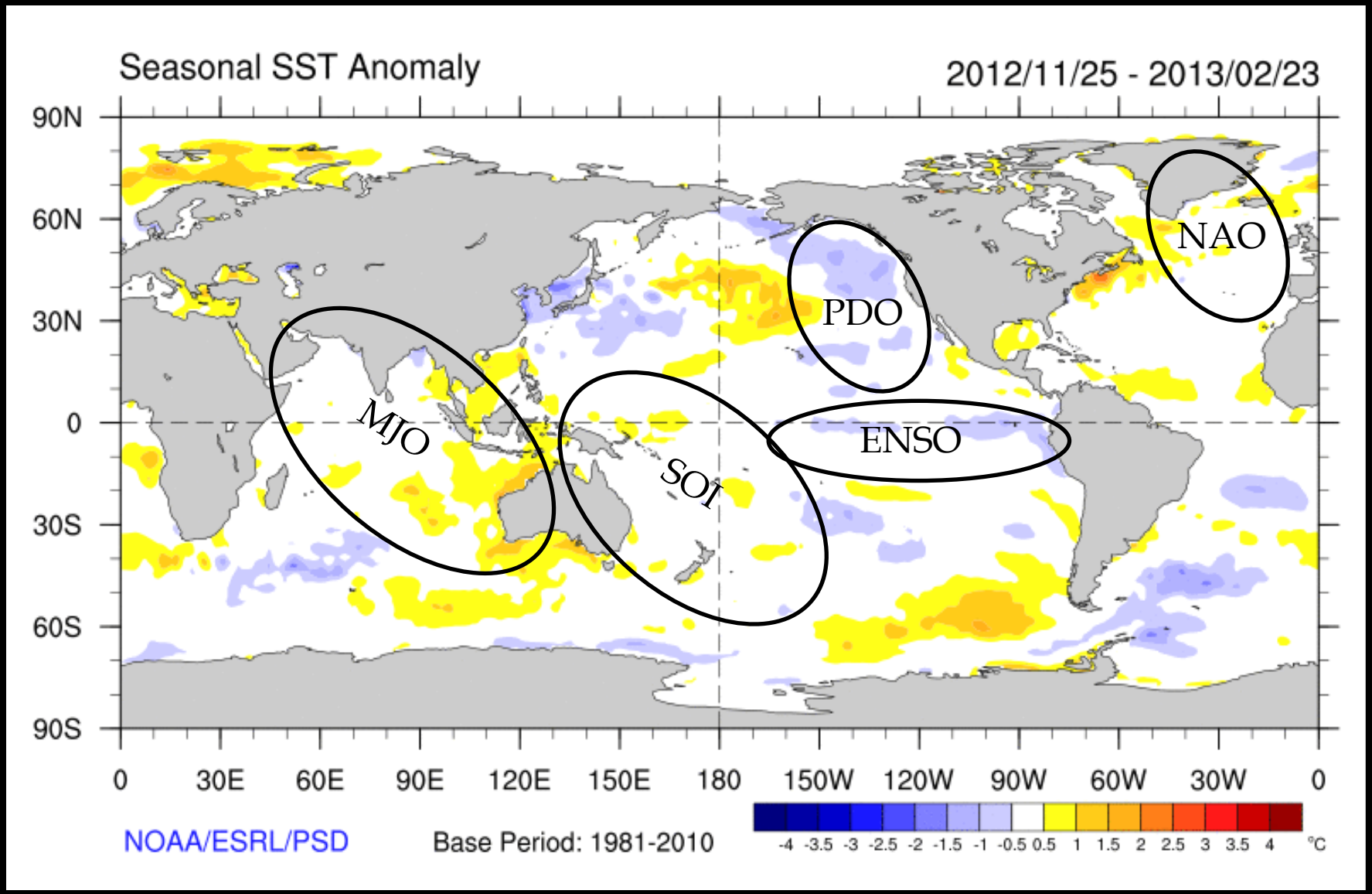
Seasonal Outlook

RMA 90-Day Percent of Normal Precipitation (January and March 2013)



Seasonal Outlook

Sea Surface Temperature Anomalies

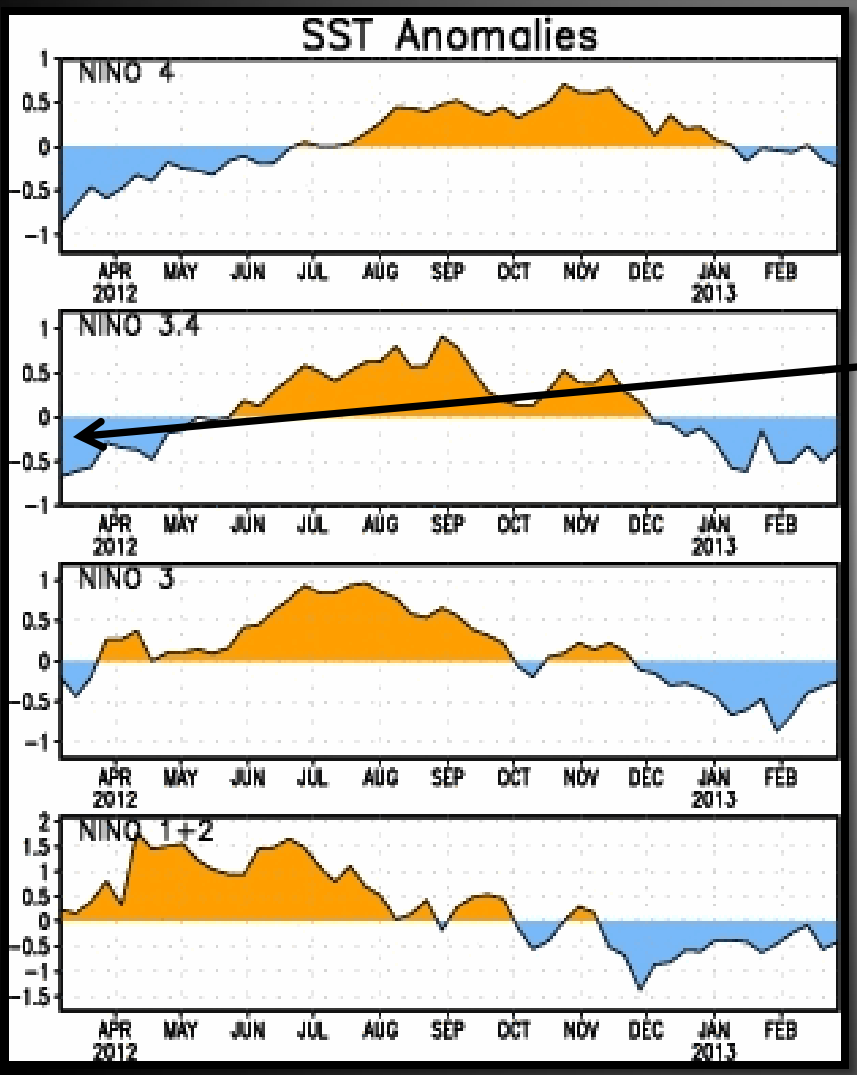


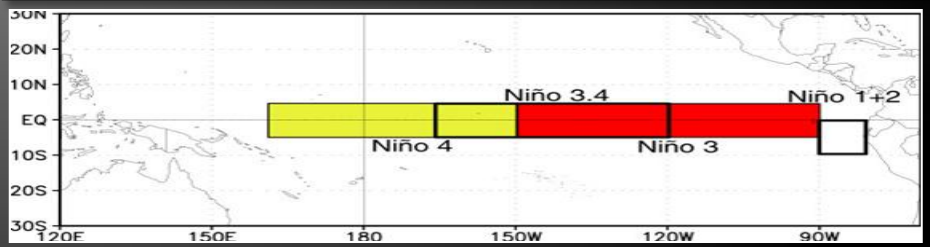
Seasonal Outlook

El Nino Southern Oscillation (ENSO)

ENSO

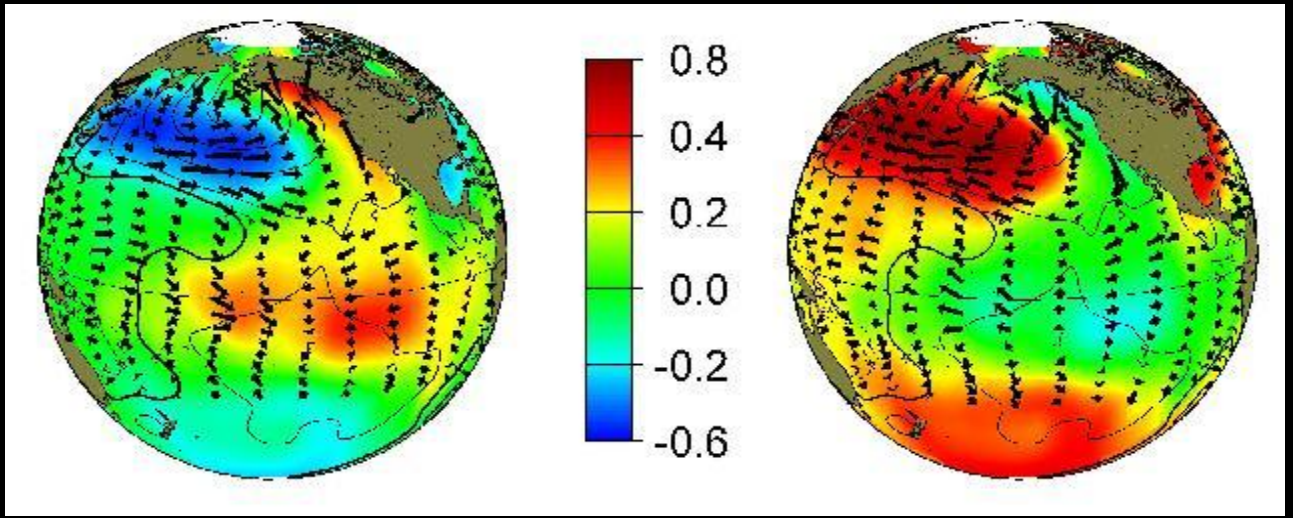
A two year La Nina episode gave way to a short-lived El Nino late spring and early summer.

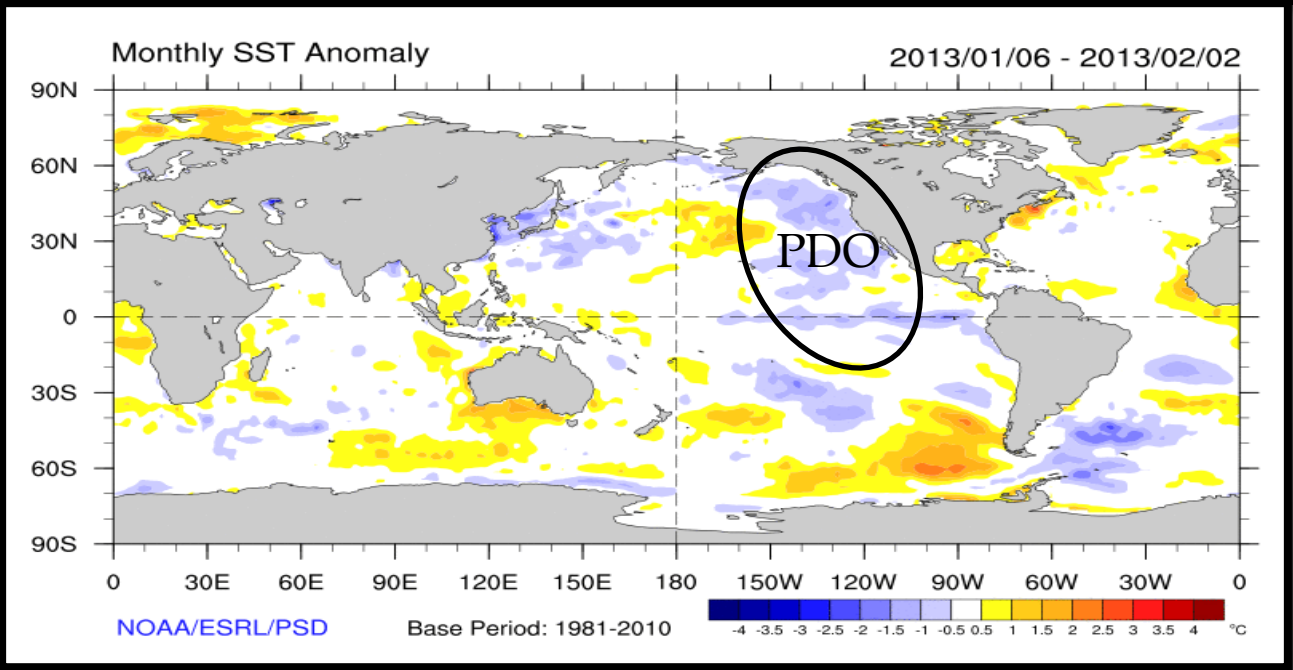




Seasonal Outlook

Pacific Decadal Oscillation (PDO)





Pacific Decadal Oscillation

20-30 Year Cycle

Negative for 5 years (perhaps since 1999)

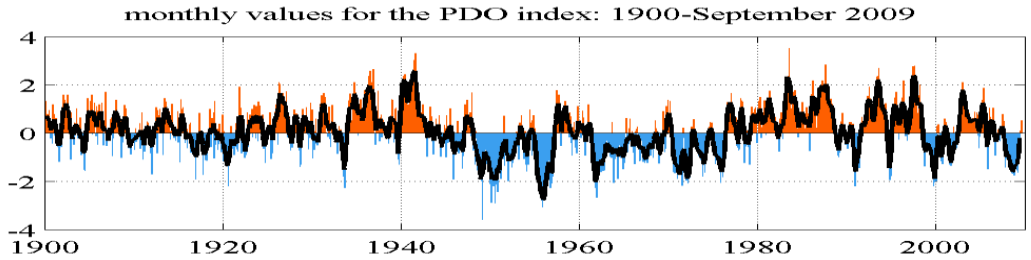
ENSO and PDO

-PDO=75% ENSO Neutral or La Nina

Research supports precipitation deficits during the winter season with no impact on the southwest monsoon

Rocky Mountain Area

Pacific Decadal Oscillation (PDO)



Pacific Decadal Oscillation

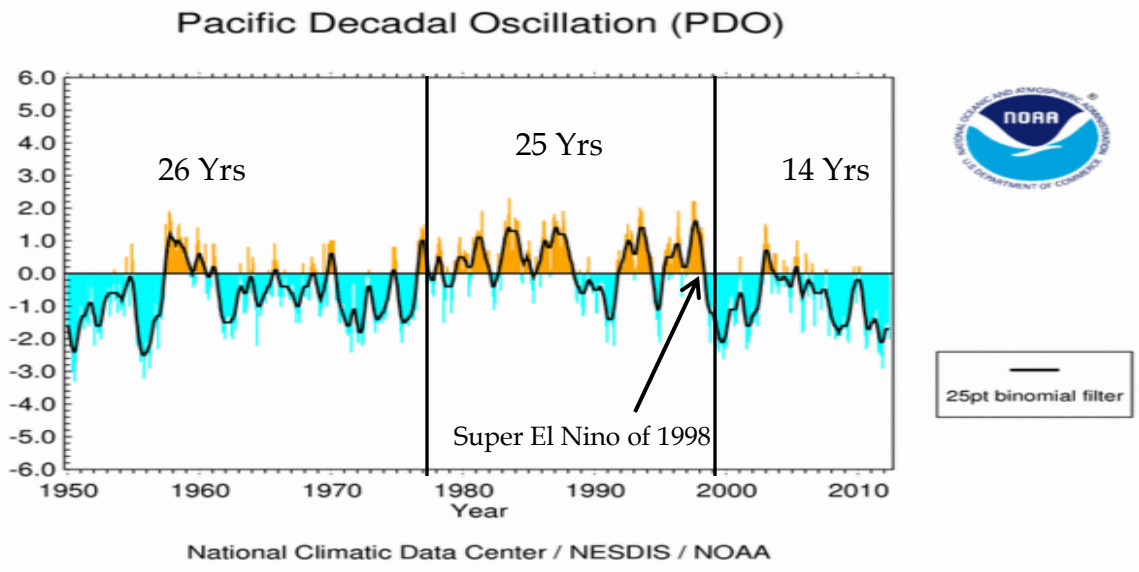
20-30 Year Cycle

Negative for 5 years (perhaps since 1999)

Research supports precipitation deficits during the winter season with no impact on the southwest monsoon

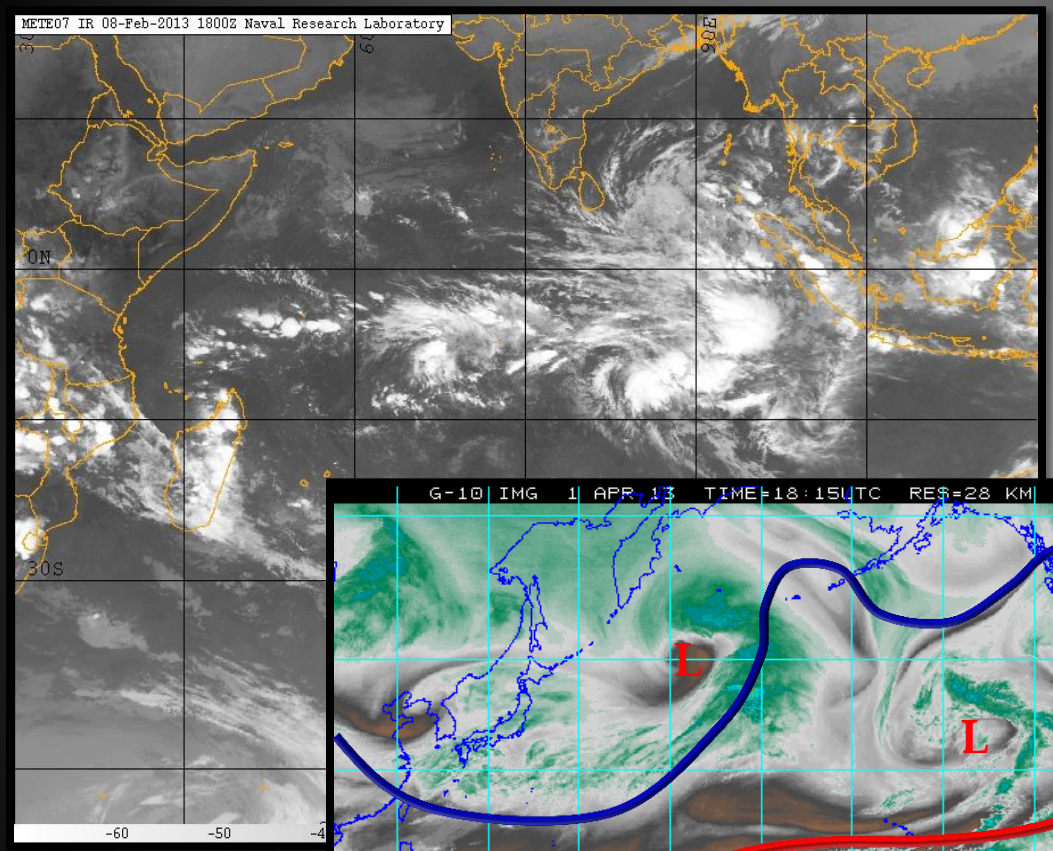
PDO and ENSO-

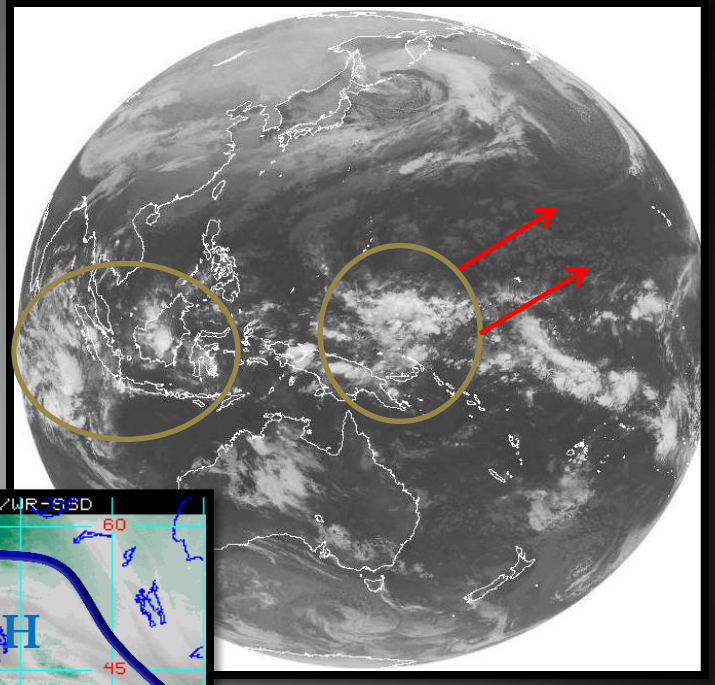
Negative PDO and Negative ENSO (La Nina)

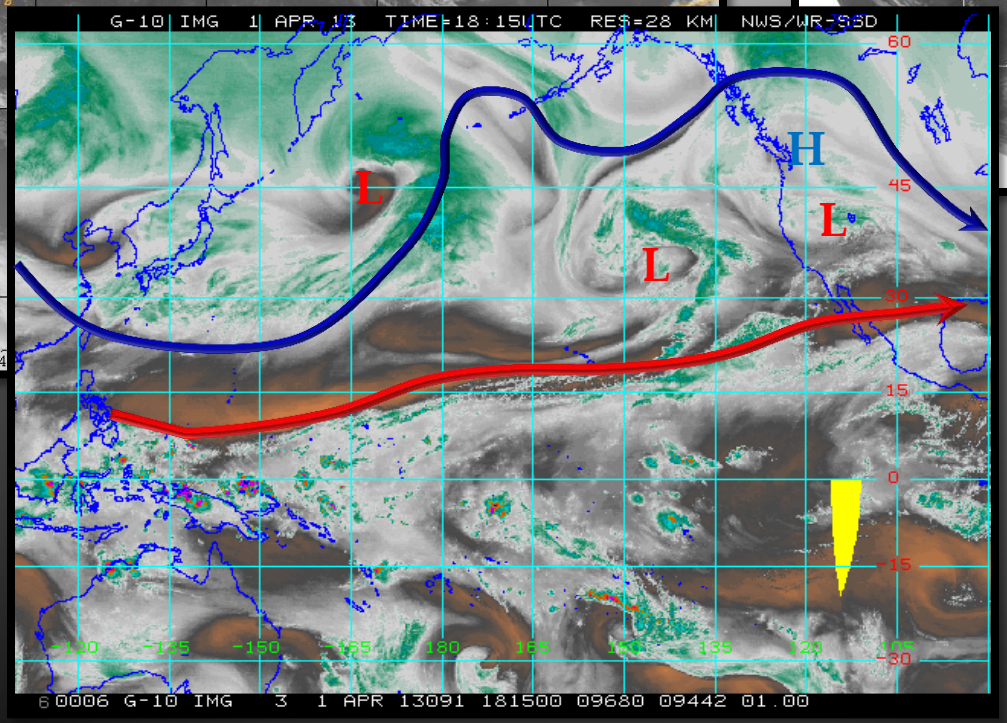


Rocky Mountain Area

Active Tropics- Madden-Julian Oscillation- MJO

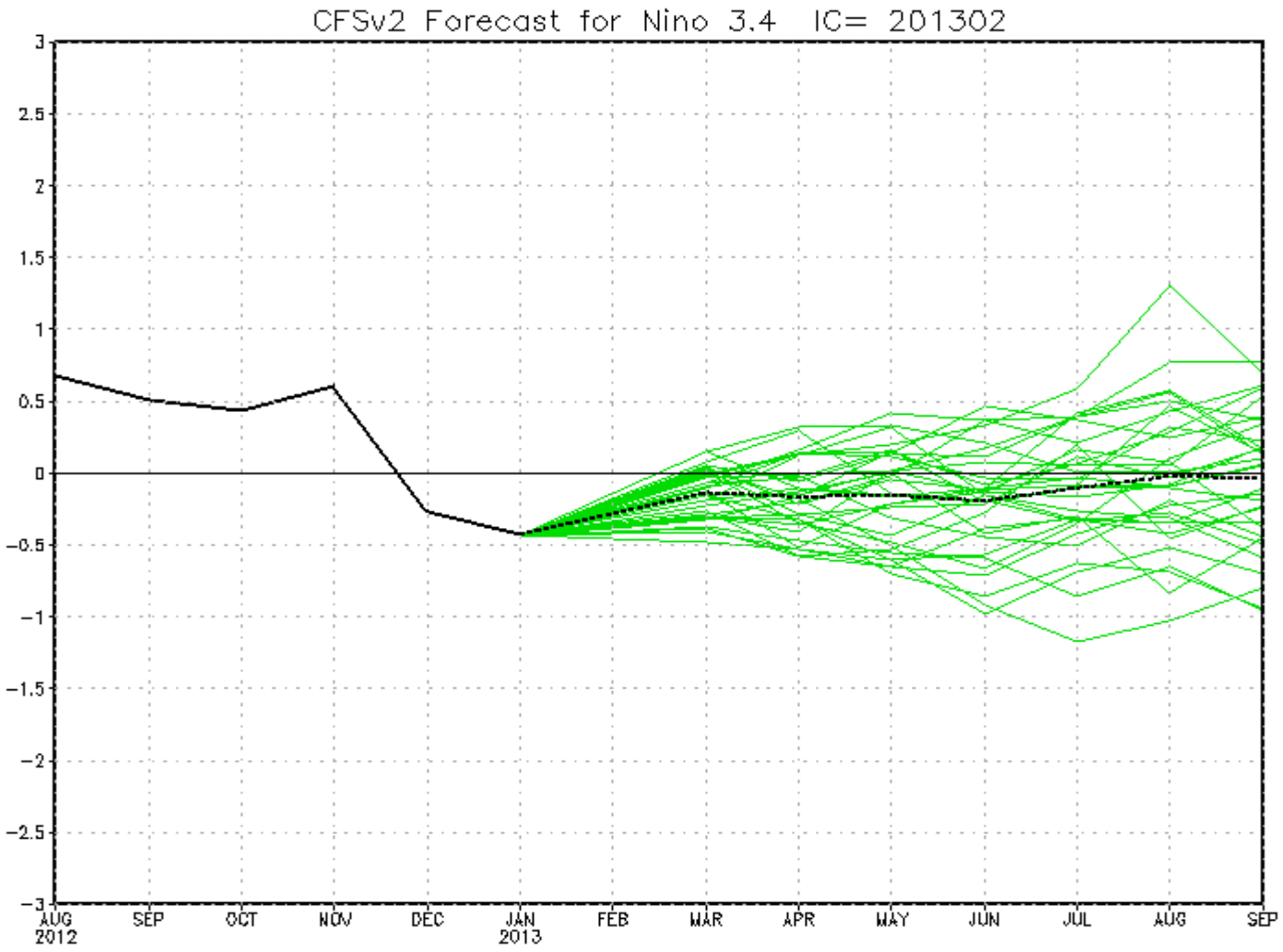


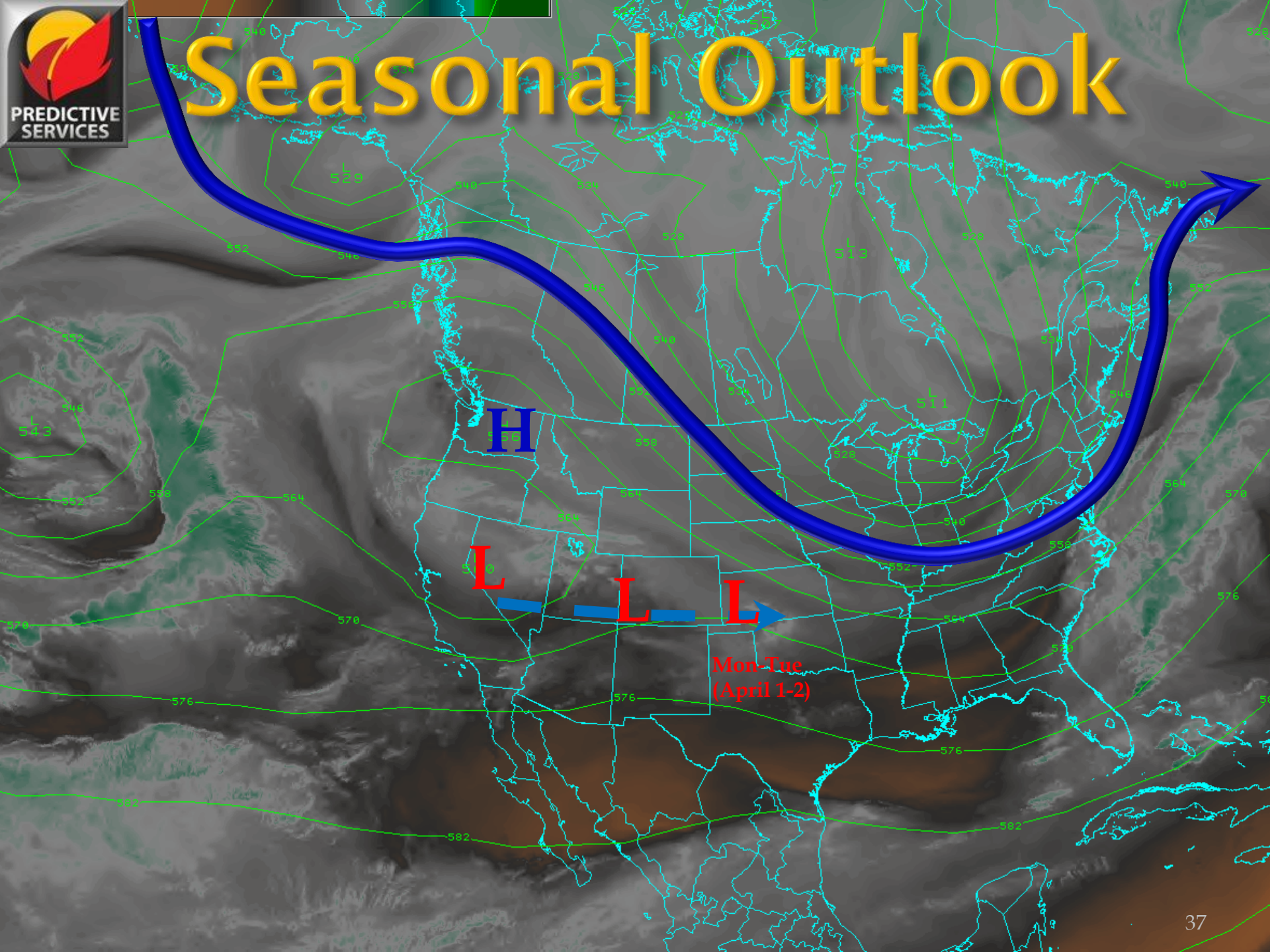




Seasonal Outlook

El Nino Southern Oscillation (ENSO) Forecast




Seasonal Outlook
PREDICTIVE SERVICES
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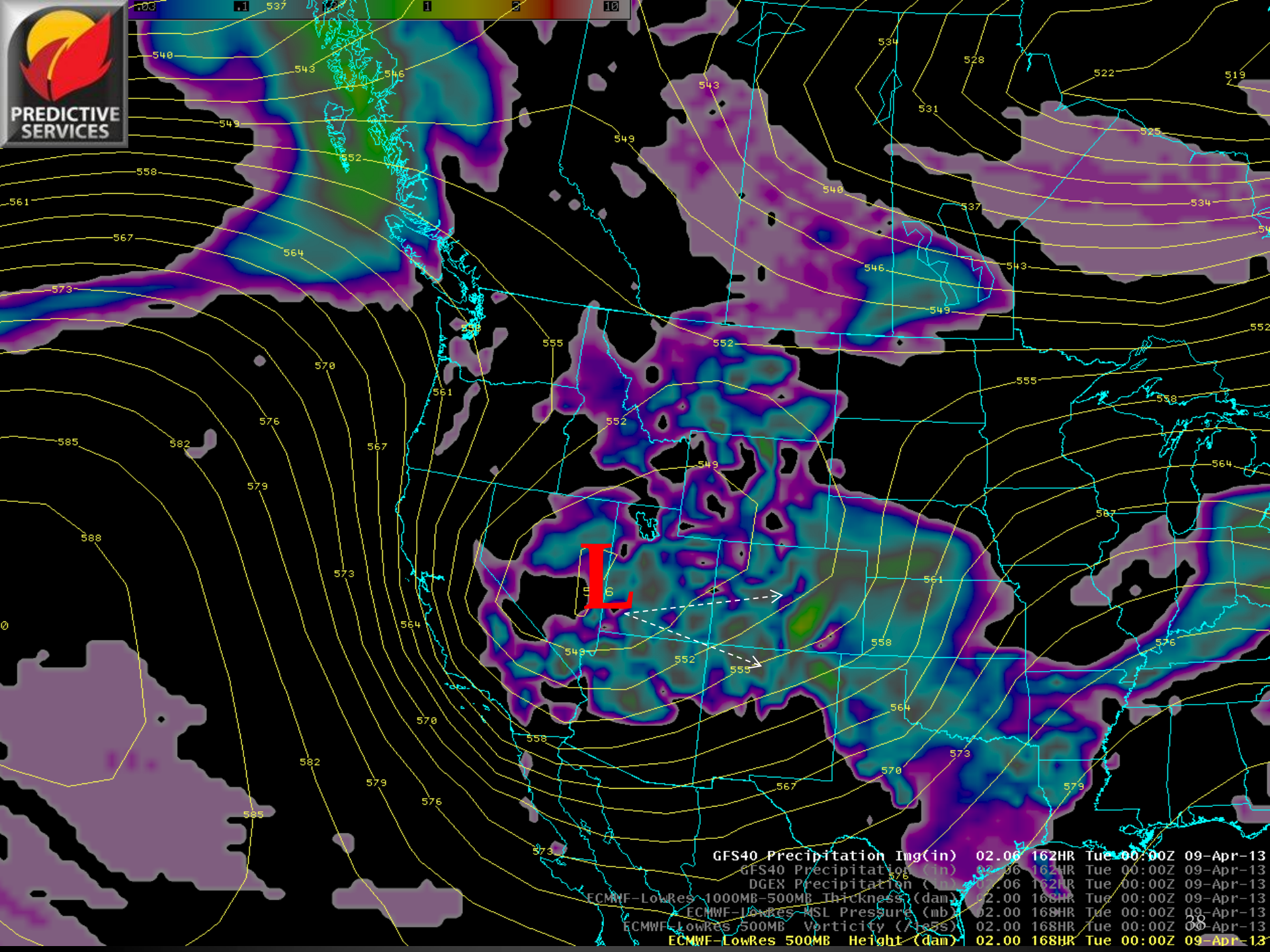
Mon-Tue
(April 1-2)


PREDICTIVE SERVICES
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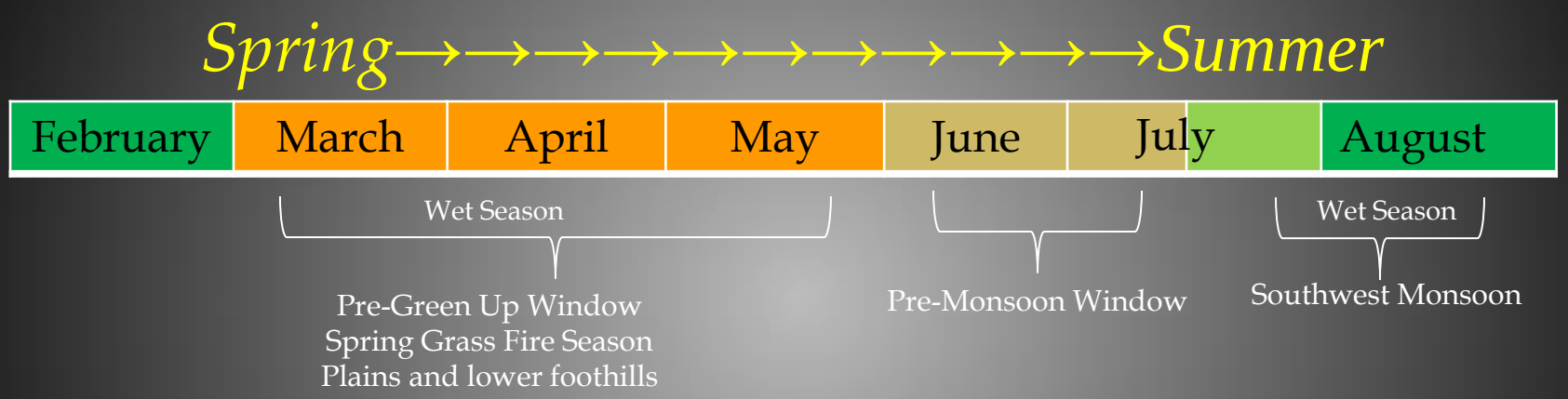
GFS40 Precipitation Img(in) 02.06 162HR Tue 00:00Z 09-Apr-13
GFS40 Precipitation (in) 02.06 162HR Tue 00:00Z 09-Apr-13
DGEX Precipitation (in) 02.06 162HR Tue 00:00Z 09-Apr-13
ECMWF-LowRes 1000MB-500MB Thickness (dam) 02.00 168HR Tue 00:00Z 09-Apr-13
ECMWF-LowRes MSL Pressure (mb) 02.00 168HR Tue 00:00Z 09-Apr-13
ECMWF-LowRes 500MB Vorticity (/sec) 02.00 168HR Tue 00:00Z 09-Apr-13
ECMWF-LowRes 500MB Height (dam) 02.00 168HR Tue 00:00Z 09-Apr-13

Seasonal Outlook

Fire Season Windows

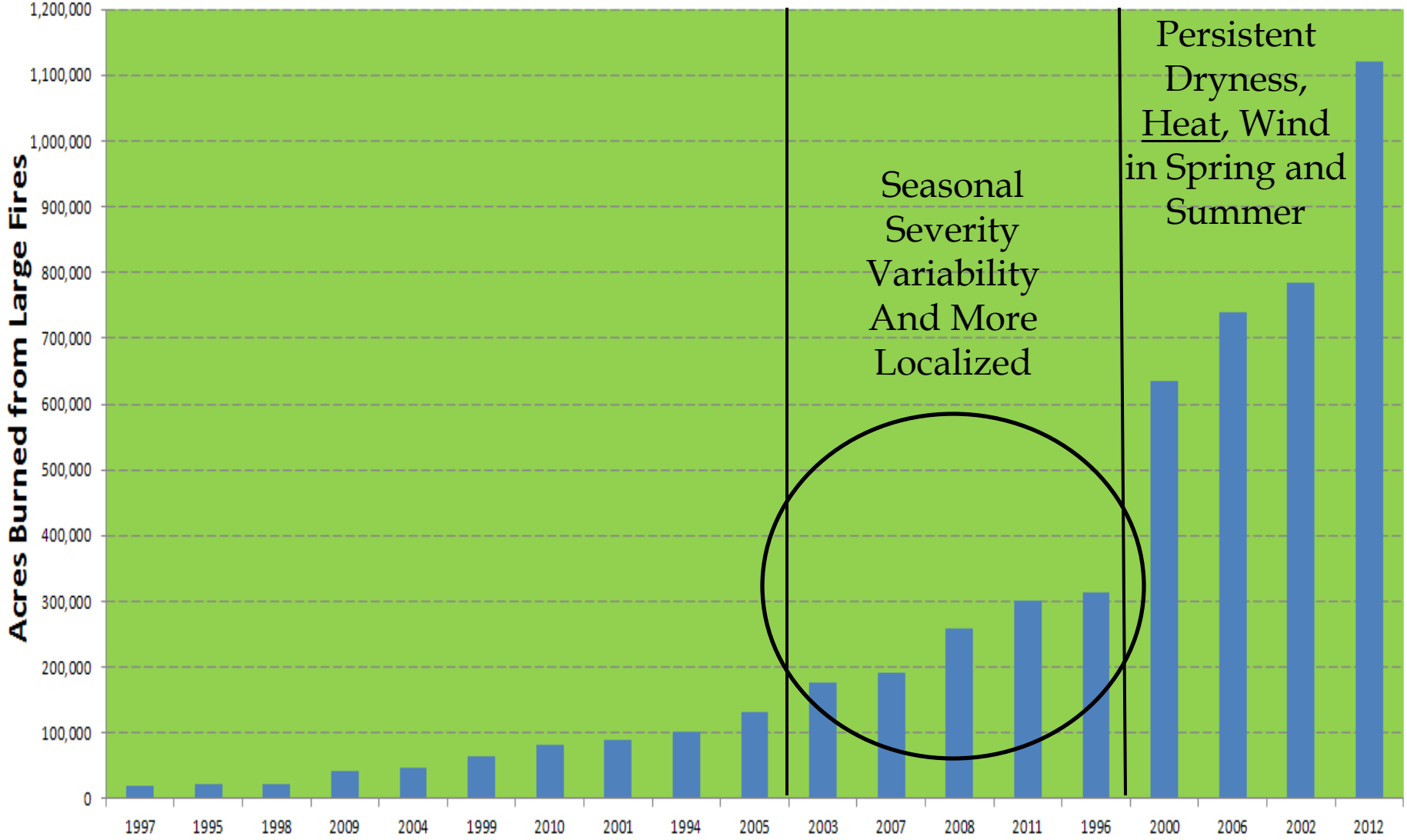


Characteristics and Common Themes to "Severe" or Very Busy Fire Seasons in Colorado:

1. Significant spring precipitation deficits
2. Above average temperatures with early depletion of snowpack
3. Early onset of fire season (April 2002, March 2012)
4. Weak Southwest Monsoon or delayed start
5. Alignment of weather, fuels and topography
6. Timber fires that require significant resource commitment
7. Ignition (Human and Natural)

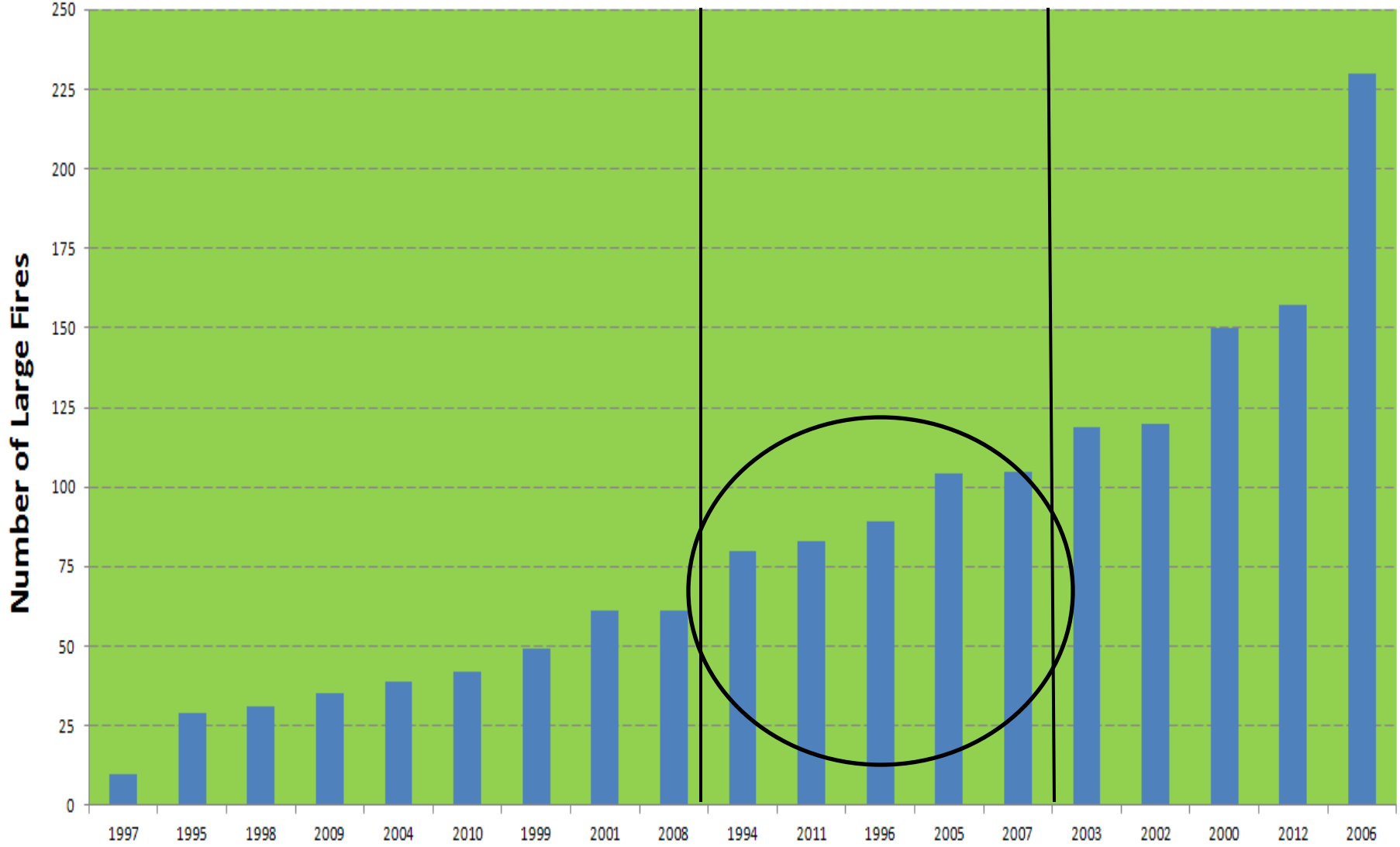
PREDICTIVE SERVICES

RMA 1994-2012



PREDICTIVE SERVICES

RMA 1994-2012



Spring/Summer Fire Season Outlook and Considerations:

1. More variability in the weather pattern is forecast through spring of 2013.

2. Extreme temperature, RH, wind event frequency less in 2013 than 2012 (at least so far)

3. Active late February through March weather pattern, but precipitation not generous to everyone

4. A Complete "Catch-Up" to Average Snowpack is Unlikely. Cooler temperatures has maintained snowpack.

5. Active Spring Weather Pattern Would Not Eliminate Drought, but would reduce impacts and shorten the 2013 Fire Season Window.

6. Wind Event Frequency and Magnitude (In combination with low RH)- Less than 2012

7. A repeat of a severe fire season is unlikely, however We Will Have a Fire Season.

Concerns:

1. **Drought Impact on Fuel Dryness heading into Fire Season (June- August). Spring precipitation and temperature trends will have to be monitored on a regular basis.**

2. **Snowpack off 3-4 weeks early.**

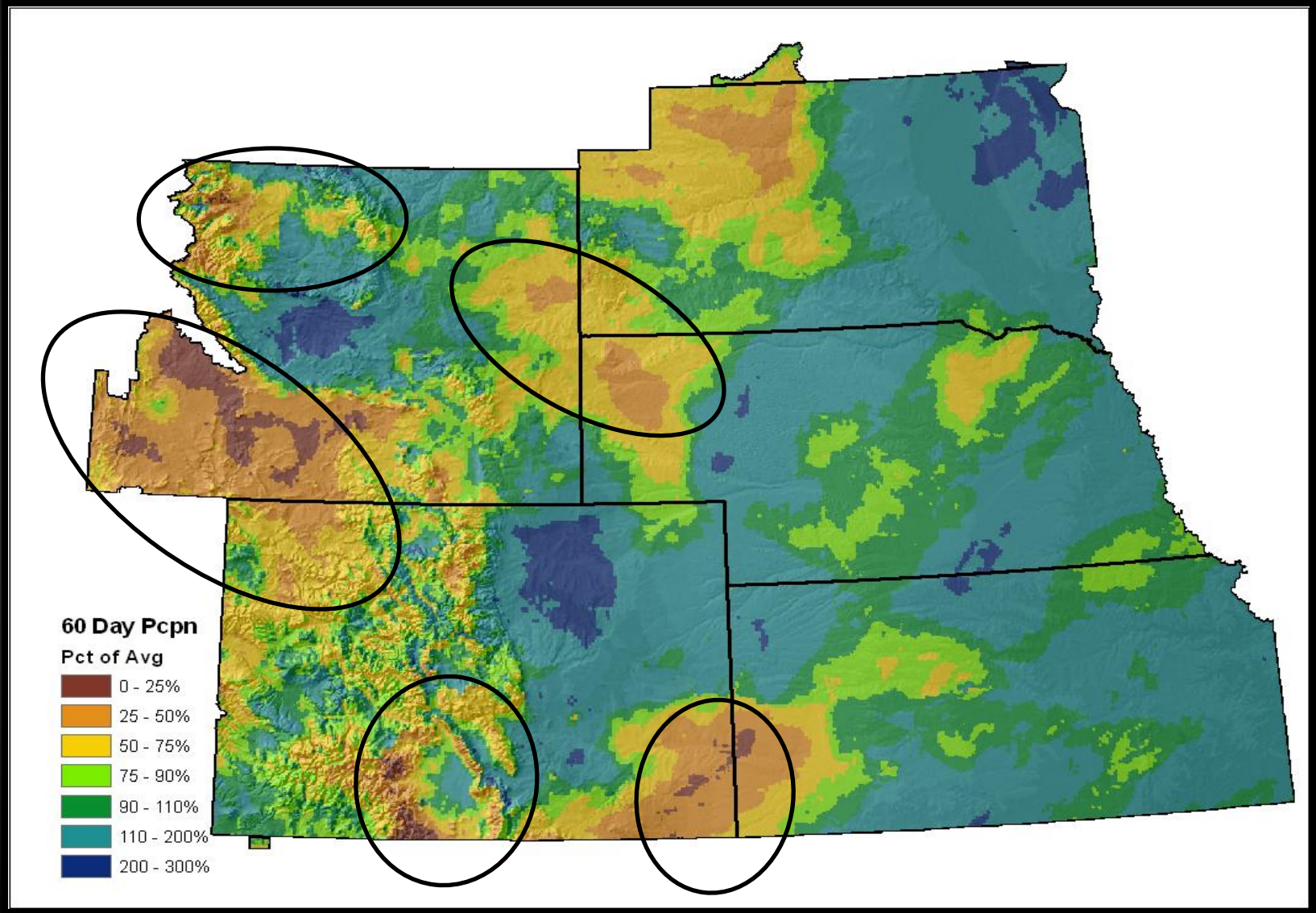
3. **Shorter Fire Window (compared to 2012), but intense because of drought.**

4. Fire season could be focused at lower elevations (new grass crop?)

5. Timing and Strength of Southwest Monsoon?

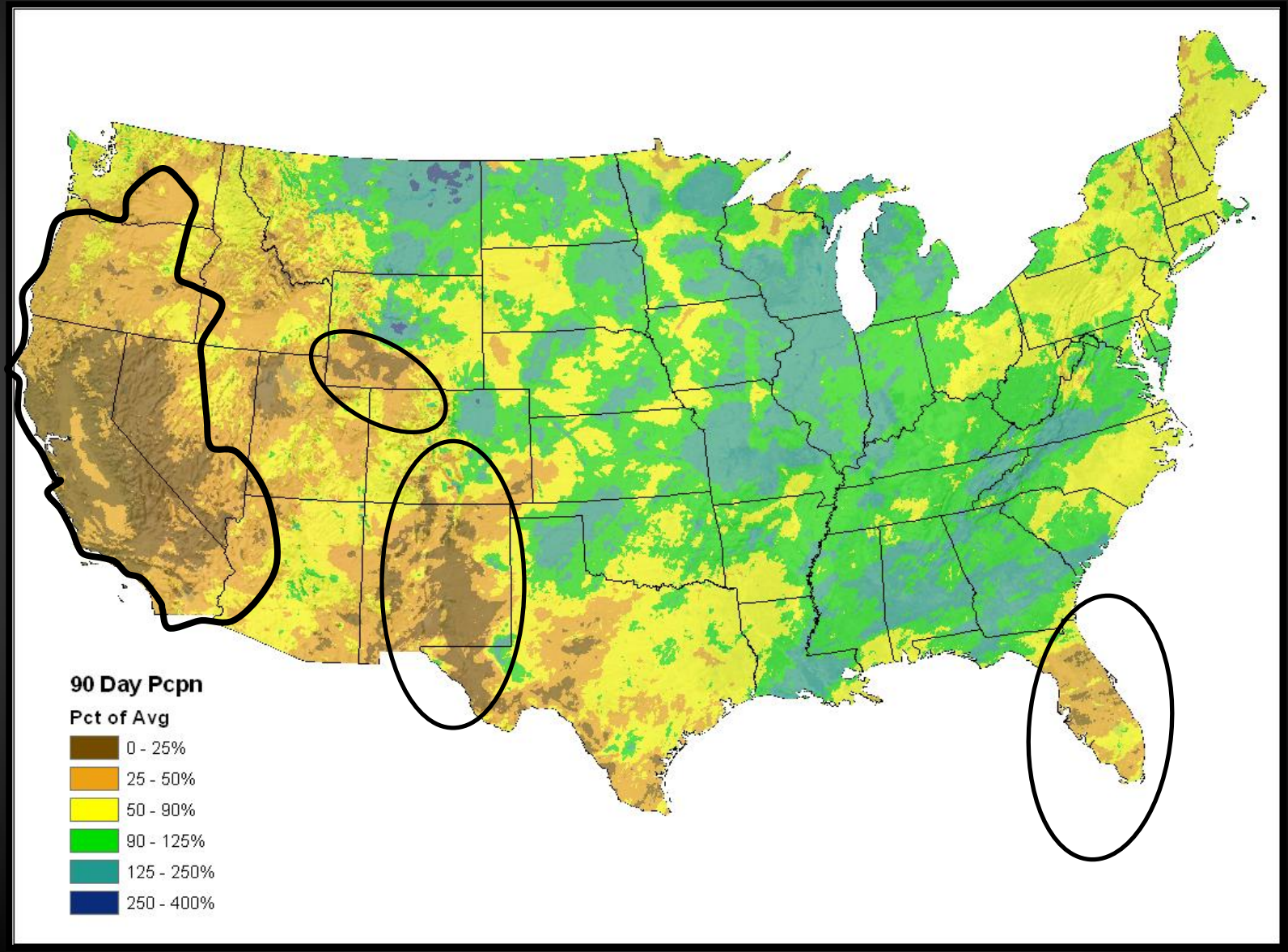
Seasonal Outlook

Preliminary 2013 RMA Fire Season Outlook



Seasonal Outlook

The National Perspective



Seasonal Outlook

Questions

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